Deepwater Horizon Oil Spill Final Phase IV Early Restoration Plan and Environmental Assessments

September 2015

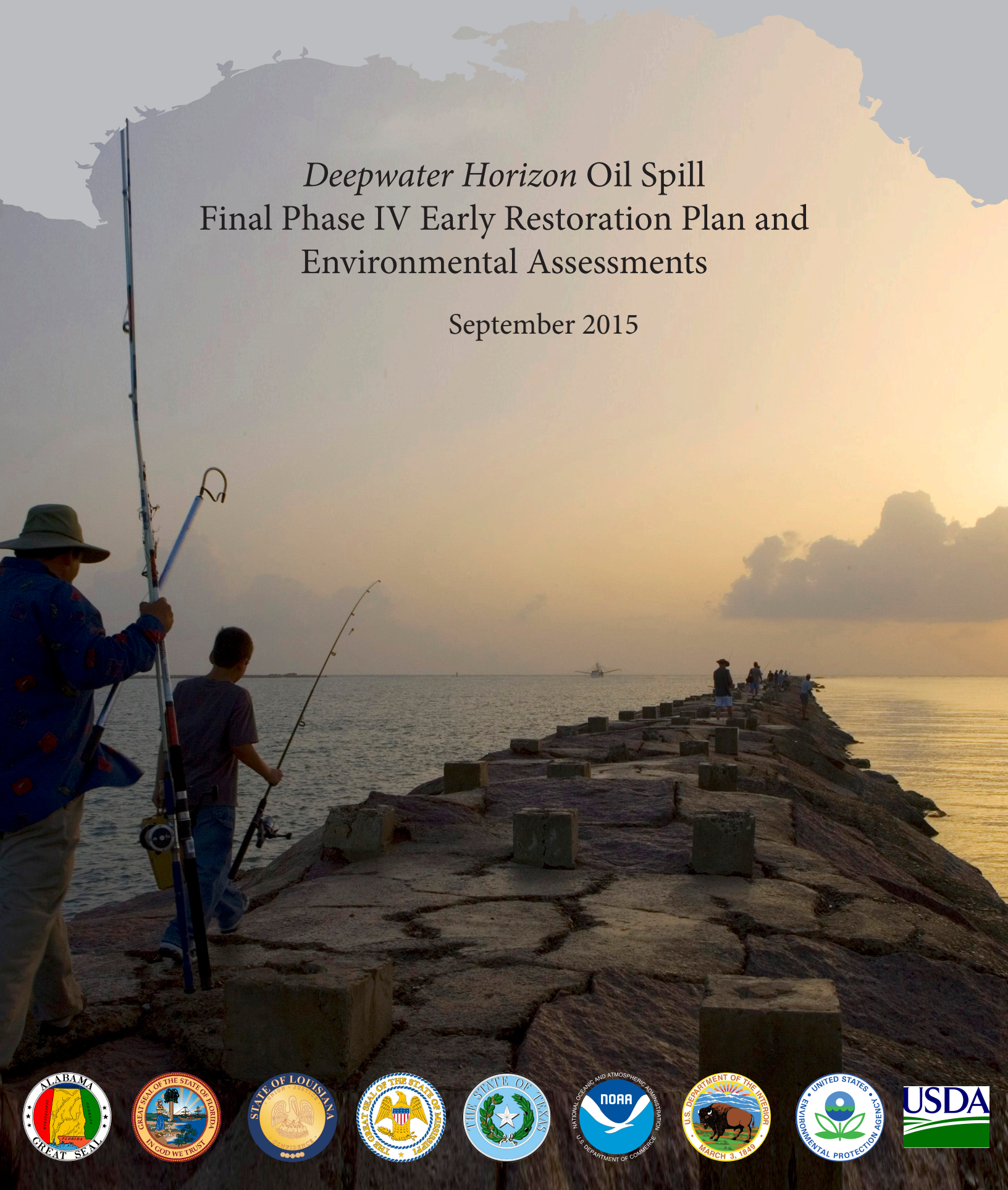


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ES.1.1 Introduction

In July 2015, BP announced that it reached Agreements in Principle (AIPs) with the United States and the Gulf States of Alabama, Florida, Louisiana, Mississippi, and Texas for settlement of civil claims arising from the *Deepwater Horizon* oil spill. The terms of the proposed settlements are subject to a confidentiality order and will not become final until, among other things, a consent decree is negotiated, is made available for public review and comment, and is approved by the court. The Trustees expect the Early Restoration projects described in this document to go forward regardless of whether the proposed settlement is approved and, therefore, have proceeded with the finalization of the Phase IV ERP/EA.

On or about April 20, 2010, BP Exploration and Production Inc. (BP) was using Transocean's mobile offshore drilling unit *Deepwater Horizon* to drill a well in the Macondo prospect (Mississippi Canyon 252 – MC252) when the well blew out, and the drilling unit exploded, caught fire and subsequently sank in the Gulf of Mexico (the Gulf). This incident resulted in an unprecedented volume of oil and other discharges from the rig and from the wellhead on the seabed. Tragically, 11 workers were killed and 19 injured. The *Deepwater Horizon* oil spill is the largest maritime oil spill in U.S. history, discharging millions of barrels of oil over a period of 87 days (hereafter referred to as "the Spill," which includes activities in response to the spilled oil). In addition, well over one million gallons of dispersants[1] were applied to the waters of the spill area in an attempt to disperse the spilled oil. An undetermined amount of natural gas was also released to the environment as a result of the Spill (National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011)[2].

The U.S. Coast Guard responded and directed federal efforts to contain and clean up the Spill. At one point nearly 50,000 responders were involved in cleanup activities in open water, beach and marsh habitats. The scope, nature and magnitude of the Spill caused 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, including estuaries, shorelines and coastal marshes. Affected resources include ecologically, recreationally, and commercially important species and their habitats in the Gulf and along the coastal areas of Texas, Louisiana, Mississippi, Alabama, and Florida. These fish and wildlife species and their supporting habitats provide a number of important ecological and recreational use services.

Pursuant to the Oil Pollution Act (OPA), Title 33 United States Code (U.S.C.) § 2701 *et seq*. and the laws of individual affected states, federal and state agencies, Indian tribes and foreign governments act as

[1] Dispersants means those chemical agents that emulsify, disperse, or solubilize oil into the water column or promote the surface spreading of oil slicks to facilitate dispersal of the oil into the water column (40 C.F.R. 300 Subpart A).

[2] National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. 2011. Deep Water: The Gulf Oil Disaster And The Future Of Offshore Drilling. Available at: http://www.gpo.gov/fdsys/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf

trustees on behalf of the public to assess injuries to natural resources and their services[3] that result from an oil spill incident, and to 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 resources under their trusteeship (hereafter collectively referred to as "restoration"). This process of injury assessment and restoration planning is referred to as natural resource damage assessment (NRDA). OPA defines "natural resources" to include land, fish, wildlife, biota, air, water, ground water, drinking water supplies and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the Exclusive Economic Zone), any State or local government or Indian tribe, or any foreign government (33 U.S.C. § 2701(20)).

The Federal Trustees are designated pursuant to section 1006(b)(2) of OPA (33 U.S.C. § 2706(b)(2)) and Executive Orders 12777 and 13626. The following federal agencies are the designated natural resource Trustees under OPA for this Spill:[4]

- The United States Department of the Interior (DOI), as represented by the National Park Service (NPS), United States Fish and Wildlife Service (USFWS), and Bureau of Land Management;
- The National Oceanic and Atmospheric Administration (NOAA), on behalf of the United States Department of Commerce;
- The United States Department of Agriculture (USDA); and
- The United States Environmental Protection Agency (EPA).

State Trustees are designated by the governors of each state pursuant to section 1006(b)(3) of OPA (U.S.C. § 2706(b)(3)). The following state agencies are designated natural resources Trustees under OPA and are currently acting as Trustees for the Spill:

- Texas Parks and Wildlife Department (TPWD), Texas General Land Office (TGLO) and Texas Commission on Environmental Quality (TCEQ);
- The State of Louisiana's Coastal Protection and Restoration Authority (CPRA), Oil Spill Coordinator's Office (LOSCO), Department of Environmental Quality (LDEQ), Department of Wildlife and Fisheries (LDWF) and Department of Natural Resources (LDNR);
- The State of Mississippi's Department of Environmental Quality (MDEQ);
- The State of Alabama's Department of Conservation and Natural Resources (ADCNR) and Geological Survey of Alabama (GSA); and
- The State of Florida's Department of Environmental Protection (FDEP) and Fish and Wildlife Conservation Commission (FWC).

This document (Final Phase IV ERP/EA), prepared jointly by State and Federal Trustees, serves as a Final Phase IV Early Restoration Plan under OPA, and also contains the associated assessment for each project

[3] Services (or natural resource services) means the functions performed by a natural resource for the benefit of another natural resource and/or the public (15 C.F.R. § 990.30).

[4] The U.S. Department of Defense is a trustee under OPA of natural resources at its Gulf Coast facilities potentially affected by the Spill but is not a member of the Trustee Council and did not participate in the preparation of this document.

under the National Environmental Policy Act (NEPA). Consistent with the Phase III Early Restoration Plan and Programmatic Environmental Impact Statement (Final Phase III ERP/PEIS), the DOI is the lead federal agency for preparing the Final Phase IV ERP/EA. The Federal co-Trustees are cooperating agencies pursuant to NEPA (40 C.F.R. §1508.5). These cooperating agencies intend to adopt these EAs, once completed. This document is prepared in accordance with 40 C.F.R. Parts1500-1508, "CEQ's Regulations for Implementing NEPA", and DOI NEPA implementing regulations (43 C.F.R. Part46).

In addition to acting as Trustees for this incident under OPA, the States of Texas, Louisiana, Mississippi, Alabama, and Florida are also acting pursuant to their applicable state laws and authorities, including but not limited to:

- The Texas Oil Spill Prevention and Response Act of 1991, Tex. Nat. Res. Code, Chapter 40;
- 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 Mississippi Air and Water Pollution Control Law, Miss. Code Ann. §§ 49-17-1 through 49-17-43;
- Alabama Code §§ 9-2-1 *et seq.* and§§ 9-4-1 *et seq.*;
- The Florida Pollutant Discharge Prevention and Removal Act, Fla. Stat., Section 376.011 *et seq*.

This Final Phase IV ERP/EA serves as an Early Restoration Plan and Environmental Assessments for an additional 10 Early Restoration projects, with a total estimated cost of approximately $134 million. Any additional projects that are proposed for and selected will be included in subsequent Restoration plans to be released at a future date.

ES.1.2 Early Restoration Framework Agreement

The early restoration planning process is designed to be a cooperative endeavor between the Trustees and parties responsible for oil spills. On April 20, 2011, BP agreed to provide up to $1 billion toward Early Restoration projects in the Gulf of Mexico to address injuries to natural resources caused by the Spill. This Early Restoration agreement, entitled "Framework for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill" (Framework Agreement), represents a preliminary 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 injury 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 the resolution of the Trustees' natural resource damages claim. Early restoration is not intended to, and does not fully address all injuries caused by the Spill.

The early restoration planning process is part of the NRDA, but is also shaped in part by the Framework Agreement with BP. The Framework Agreement is a partial, interim settlement under which BP is making up to $1 billion available for early restoration, in return for agreed offsets ("NRD Offsets" explained later in this document) to be applied by the Trustees in the future as credit against the Trustees' final assessment of total injury to resources impacted by the Spill. This provides an opportunity for the Trustees to make progress towards restoration while the steps needed to determine the full

amount of injury and natural resource damage unfold. At the same time, under the Framework Agreement, a proposed early restoration project may be funded only if all of the Trustees, the U.S. Department of Justice, and BP agree on, among other things, the amount of funding to be provided by BP and the Offsets against injury or service losses attributable to that project. The need for project-specific agreements inevitably affects which projects are practical to pursue in the early restoration process.

By its nature, the early restoration process is not intended to accomplish full restoration. Because final determinations of injury will not be completed for some time, it would be premature to say now what proportion of any particular type of injury would be addressed by the projects in this Phase IV ERP/EA. Early restoration projects represent an initial step toward fulfilling the responsible parties' obligation to pay for restoration of injured natural resources. Ultimately, the responsible parties are obligated to compensate the public for the full scope of natural resource injuries caused by the Spill, including the cost of assessment and restoration planning.

ES.1.3 Relationship of Phase IV ERP/EA to the Final Phase III ERP/PEIS

The Trustees are selecting, in this Final Phase IV ERP/EA, 10 projects in accordance with OPA and under the Framework Agreement that are meant to continue implementation of Early Restoration for the purpose of accelerating meaningful restoration of injured natural resources and their services resulting from the Spill. Given the potential magnitude and breadth of further Early Restoration, the Trustees previously prepared a Programmatic Early Restoration Plan and Programmatic Environmental Impact Statement (Final Phase III ERP/PEIS) under OPA and NEPA to analyze alternative approaches to continuing Early Restoration and to consistently guide remaining Early Restoration decisions.

The regulations that guide NRDAs under OPA require that restoration planning actions undertaken by Federal Trustees comply with NEPA, 42 U.S.C. §§ 4321 *et seq.*, and the regulations guiding its implementation at 40 C.F.R. Parts 1500-1508 (15 C.F.R. § 990.23). NEPA and its implementing regulations outline the responsibilities of federal agencies, including the preparation of environmental impact analysis such as an environmental impact statement.

When a federal agency prepares a programmatic NEPA analysis, such as a programmatic EIS, the agency may "tier" subsequent narrower environmental analyses on site-specific plans or projects from the programmatic analysis (40 C.F.R. §§ 1502.20, 1508.28). Federal agencies are encouraged to tier subsequent narrower analyses from a programmatic NEPA analysis to eliminate repetitive discussions of the same issues and to focus on the issues ripe for decision at each level of environmental review (40 C.F.R. § 1502.20).

This Phase IV ERP/EA is tiered from the programmatic portions of the Phase III ERP/PEIS (40 C.F.R. § 1508.28) which is incorporated here by reference (40 C.F.R. § 1502.21).[5] The programmatic analyses included in the Final Phase III ERP/PEIS streamline Early Restoration planning by evaluating broad issues and impacts associated with all project types included in the programmatic plan, thereby allowing the

[5] The Final Phase III ERP/PEIS is available at: http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/phase-iii/.

Trustees to tier project-specific analyses from the programmatic analyses. Tiering project-specific analyses reduces or eliminates duplicative documentation by focusing project analyses on project-specific issues and incorporating by reference the issues evaluated in the broad programmatic analyses. For proposed Phase IV Early Restoration projects, the Trustees have considered the extent to which additional NEPA analyses may be necessary for the projects that tier from the PEIS. These considerations include whether the analyses of relevant conditions and environmental effects described in the PEIS are still valid or whether projects have been considered in separate analyses under NEPA for purposes of other federal processes. These considerations are addressed in the project-specific environmental reviews included in this document (see Chapters 5-14).

ES.1.4 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 recover to baseline conditions (compensatory restoration). NRDA restoration planning has two basic components: (1) injury assessment and (2) restoration selection. Given its expansive geographic scale and complexity, the *Deepwater Horizon* NRDA process may continue for several more years. Therefore, for the purpose of accelerating meaningful restoration of injured natural resources and their services resulting from the Spill, the Trustees propose to continue implementation of Early Restoration in accordance with OPA and the Final Phase III ERP/PEIS, using funds made available in the Framework Agreement. Having completed three emergency restoration projects as well as three previous phases of Early Restoration, with 54 projects totaling $698 million, the Trustees are herein proposing an additional 10 Early Restoration projects worth approximately $134 million for Phase IV of Early Restoration. Early Restoration is being initiated prior to completion of the full NRDA, and is not intended to fully address all injuries caused by the Spill. Additional projects will continue to be proposed in other Restoration plans.

ES.1.5 Early Restoration Project Selection Process

The Early Restoration selection process was developed by the Trustees to be responsive to the purpose and need for conducting Early Restoration. In summary, Early Restoration project selection is a step-wise process comprised of: (1) project solicitation; (2) project screening; (3) negotiation with BP; and (4) evaluation and environmental review of proposed projects under OPA and NEPA, including public review and comment.

The Trustees' Early Restoration project selection process initially results in a set of potential projects that, consistent with the Framework Agreement, are submitted to BP for review and discussion. The Framework Agreement requires the Trustees and BP to agree on: (1) the funding amount for a proposed project; and (2) Offsets. If the Trustees and BP reach agreement in principle on project terms, those projects are incorporated into a draft Early Restoration Plan and are subject to NEPA review. Projects can be considered ready for implementation only after consideration of comments submitted during the public review process, finalization of the Early Restoration Plan, completion of all required permits and environmental compliance reviews including NEPA, and execution and filing of the project stipulations.

With respect to the 10 projects in this Phase IV ERP/EA, as with previous phases of Early Restoration, the Trustees identified potential projects from many sources, including but not limited to: submissions from the public; Gulf restoration reports, research, management plans and related efforts; and Trustee information collection activities. The Trustees applied a screening process to be responsive to the purpose and need for conducting Early Restoration based on specified evaluation criteria and practical considerations that, while not legally mandated, are nonetheless useful and permissible to help screen potential projects.

The Trustees also established websites to provide the public information about injury and restoration processes,[6] and public solicitation of restoration projects has been ongoing since publication of the Notice of Intent to Conduct Restoration Planning for the *Deepwater Horizon* Oil Spill (2010 NOI), which was published in the Federal Register on October 1, 2010 and announced publicly by the Trustees (Discharge of Oil from Deepwater Horizon/Macondo Well, Gulf of Mexico (Intent to Conduct Restoration Planning, 75 Fed. Reg. 60,800 (October 1, 2010)). The Trustees have received hundreds of proposals, all of which can be viewed at several web pages (see footnote 6). The public provided ideas and comments at public scoping meetings focused on the PEIS for the final, comprehensive damage assessment and restoration plan[7] as well as during public meetings held during each phase of Early Restoration.

ES.1.6 Previous Phases of Early Restoration

The Trustees previously selected 54 Early Restoration projects for implementation, including: eight projects documented in the April 2012 final "*Deepwater Horizon* Oil Spill Phase I Early Restoration Plan and Environmental Assessment"; two projects documented in the December 2012 final "*Deepwater Horizon* Oil Spill Phase II Early Restoration Plan and Environmental Review"; and 44 projects documented in the June 2014 final "*Deepwater Horizon* Oil Spill: Programmatic and Phase III Early Restoration Plan and Early Restoration Programmatic Environmental Impact Statement".

As summarized in Table ES- 1, the total estimated cost of Early Restoration projects selected for implementation to date is approximately $698 million (including contingencies). Ecological projects

[6] The Trustees established the following websites:

- NOAA, Gulf Spill Restoration, available at http://www.gulfspillrestoration.noaa.gov/;
- NOAA, DIVER, available at https://dwhdiver.orr.noaa.gov/
- DOI, *Deepwater Horizon* Oil Spill Response, available at http://www.fws.gov/home/dhoilspill/;
- Texas Parks and Wildlife Department, *Deepwater Horizon* Oil Spill, available at http://www.tpwd.state.tx.us/landwater/water/environconcerns/damage_assessment/deep_water_horizon.phtml/;
- Louisiana, *Deepwater Horizon* Oil Spill Natural Resource Damage Assessment, available at http://la-dwh.com/;
- Mississippi Department of Environmental Quality, Natural Resource Damage Assessment, available at http://www.restore.ms/;
- Alabama Department of Conservation and Natural Resources, NRDA Projects, available at http://www.alabamacoastalrestoration.org; and
- Florida Department of Environmental Protection, *Deepwater Horizon* Oil Spill Response and Restoration, available at www.deepwaterhorizonflorida.com.

[7] A final Damage Assessment and Restoration Plan will outline the total injury that occurred as a result of the Spill and the plan to fully compensate the public for those losses; it will be the result of the comprehensive NRDA effort currently in process.

comprise $460 million (66%) of this total, and recreational projects comprise the remaining $238 million (34%). Within the ecological project category, barrier island restoration and dune projects account for $321 million of estimated project costs, followed by marsh living shoreline projects ($92 million), oyster projects ($35 million), sea turtle and bird habitat enhancement projects ($9 million), and seagrass projects ($3 million).

Table ES- 1. Summary of Funds Spent on Phase I, II, and III Early Restoration Project Categories

PROJECT CATEGORY	ESTIMATED COST FOR ALL PROJECTS IN THAT CATEGORY
Barrier Islands and Dunes	$321,098,721
Recreational	$237,628,642
Marsh and Living Shoreline	$92,283,748
Oyster	$35,192,681
Sea Turtle and Bird Habitat Enhancement	$8,979,283
Seagrasses	$2,691,867
Total	**$697,874,942**

ES.1.7 Notice of Change to Phase III Early Restoration Project

The Phase IV ERP/EA also includes a notice of change and supporting analysis for one Phase III Early Restoration Project, "Enhancement of Franklin County Parks and Boat Ramps – Eastpoint Fishing Pier Improvements." This is discussed in more detail in Chapter 1, section 1.7.

ES.1.8 Phase IV Projects

Table ES- 2 lists the 10 Phase IV projects, identifies the state(s) in which each is located, identifies the implementing Trustee(s), lists the project cost, and relates each project back to the programmatic Early Restoration project type(s) from the Final Phase III ERP/PEIS. Figure ES-1 shows the locations of the projects. Detailed discussions of the projects, their benefits, and associated environmental assessments are included in Chapters 5-14 of this document. Brief summaries of each project follow the table.

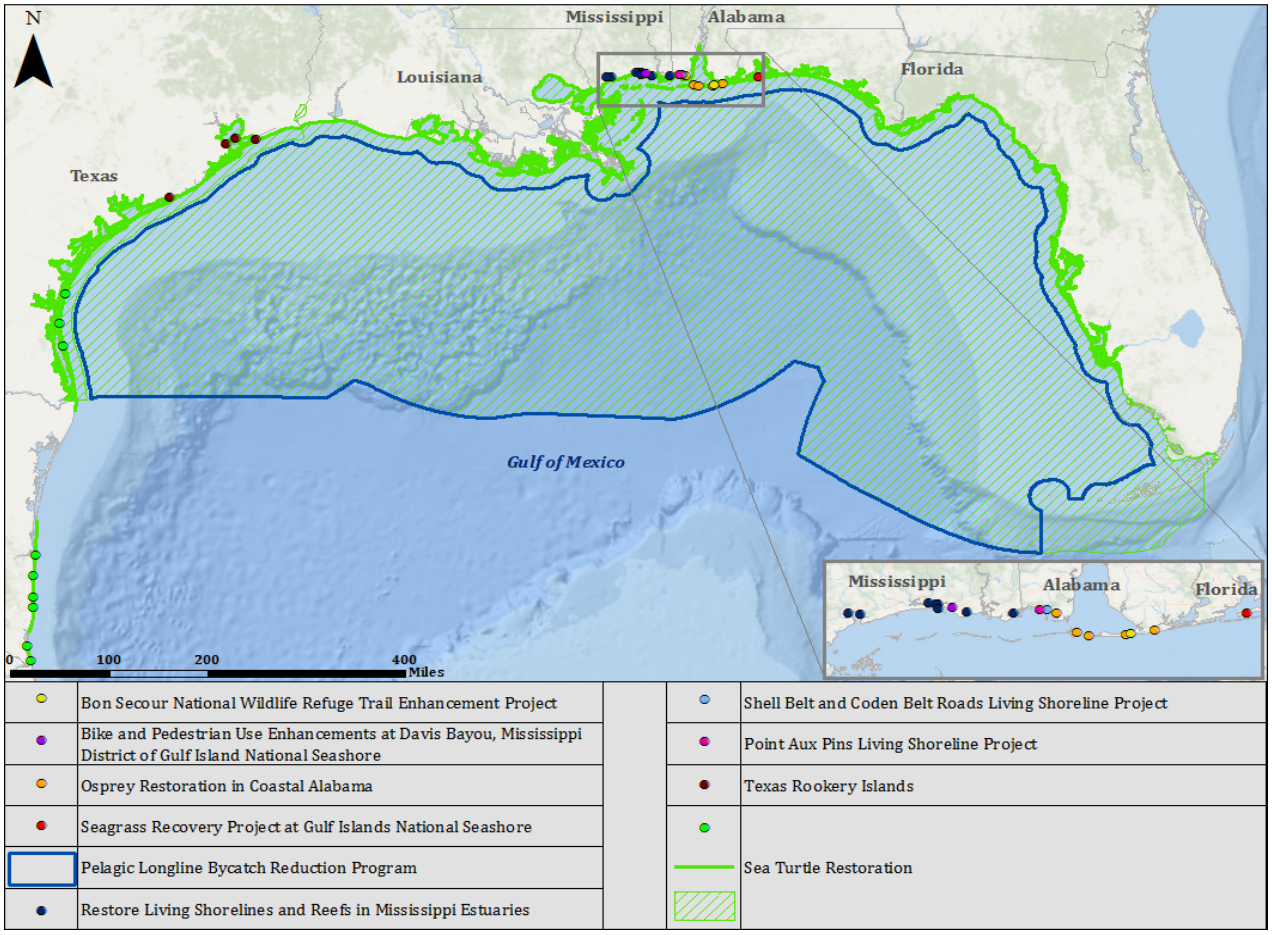
Table ES-2. Phase IV Early Restoration Projects

PROJECT TITLE	LOCATION	IMPLEMENTING TRUSTEE(S)	COST	PROJECT TYPE[1]
Texas Rookery Islands	TX	TX Trustees, DOI	$20,603,770	Restore and Protect Birds
Restore Living Shorelines and Reefs in Mississippi Estuaries	MS	MS	$30,000,000	Restore Oysters Protect Shorelines and Reduce Erosion
Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore	MS[2]	DOI	$6,996,751	Enhance Public Access to Natural Resources for Recreational Use; Enhance Recreational Experiences
Bon Secour National Wildlife Refuge Trail Enhancement Project , Alabama	AL[2]	DOI	$545,110	Enhance Public Access to Natural Resources for Recreational Use; Enhance Recreational Experiences; Promote Environmental and Cultural Stewardship, Education and Outreach

PROJECT TITLE	LOCATION	IMPLEMENTING TRUSTEE(S)	COST	PROJECT TYPE[1]
Osprey Restoration In Coastal Alabama	AL	AL	$45,000	Restore and Protect Birds
Point aux Pins Living Shoreline	AL	AL	$2,300,000	Protect Shorelines and Reduce Erosion
Shell Belt and Coden Belt Roads Living Shoreline	AL	AL	$8,050,000	Protect Shorelines and Reduce Erosion
Seagrass Recovery Project at Gulf Islands National Seashore, Florida District	FL[2]	DOI	$136,700	Restore and Protect Submerged Aquatic Vegetation
Sea Turtle Early Restoration	Gulf-wide	NOAA, TX Trustees, DOI	$45,000,000	Restore and Protect Sea Turtles
Pelagic Longline Bycatch Reduction Project	Gulf-wide	NOAA	$20,000,000	Restore and Protect Finfish and Shellfish
		Total	**$133,677,331**	

[1] Relevant project type from the Trustees' preferred programmatic alternative (see Chapter 5 of the Final Phase III ERP/PEIS).
[2] These projects will be implemented on federally managed lands and managed by DOI.

Figure ES- 1. Location of Phase IV Projects



ES.1.9 Brief Project Descriptions

ES.1.9.1 Texas Rookery Islands

The Texas Rookery Islands project will restore and protect three rookery islands in Galveston Bay and one rookery island in East Matagorda Bay using coastal engineering techniques. The primary goal of the project is to increase nesting of colonial waterbirds, including brown pelicans, laughing gulls, terns (royal and sandwich terns), and wading birds (great blue herons, roseate spoonbills, reddish egrets, great egrets, snowy egrets, tricolored herons, and black-crowned night herons). Restoration actions at each rookery island will increase the amount of available nesting habitat by increasing the size of the island, enhance the quality of habitat through the establishment of native vegetation, and increase the longevity of the habitat through the construction of protective features, such as breakwaters or armoring. These restoration actions will result in an increase in the numbers of nesting colonial waterbirds. Rookery islands in Galveston Bay include Dickinson Bay Island II, located within Dickinson Bay; Rollover Bay Island, located in East (Galveston) Bay; and Smith Point Island, located west of the Smith Point Peninsula. Dressing Point Island lies in East Matagorda Bay, and is part of the Big Boggy National Wildlife Refuge.

ES.1.9.2 Restore Living Shorelines and Reefs in Mississippi Estuaries

The Restoring Living Shorelines and Reefs in Mississippi Estuaries project will restore intertidal and subtidal reefs and use living shoreline techniques in four bays. Projects are proposed in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay, all located in Jackson, Harrison, and Hancock counties. The project will provide for the construction of more than four miles of breakwaters, five acres of intertidal reef habitat and 267 acres of subtidal reef habitat across the Mississippi Gulf Coast.

ES.1.9.3 Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore

This project will involve implementing roadway improvements for pedestrians and bicyclists in the Davis Bayou Area of Gulf Islands National Seashore. In response to prior public scoping meetings conducted outside of the Early Restoration process, NPS developed two action alternatives for this project. The NPS Preferred Alternative would widen the existing road surface on Park Road and Robert McGhee Road to accommodate multiple-use bicycle-pedestrian lanes. The other alternative would reduce the amount of automobile traffic in the park by limiting access to VFW Road during certain times of the day. Both alternatives would include two traffic-calming medians on Park Road.

ES.1.9.4 Bon Secour National Wildlife Refuge Trail Enhancement, Alabama

This project will involve repairing and improving, to an American with Disabilities Act (ADA) standard, an existing trail (Jeff Friend Trail) on Bon Secour National Wildlife Refuge (NWR). The NWR is located on the Gulf Coast, 8 miles west of the city of Gulf Shores, Alabama, in Baldwin and Mobile counties. This aged boardwalk and gravel trail will be repaired and improved to ensure safe public access and to enhance the quality of visitor experience. An observation platform will also be constructed along the trail, and two handicapped parking spaces will be widened to better accommodate visitors. The project

is not expected to significantly increase visitation, but rather to provide a safe and enhanced experience for visitors to the Refuge.

ES.1.9.5 Osprey Restoration in Coastal Alabama

The restoration project will install five osprey nesting platforms along the coast in Mobile and Baldwin Counties, Alabama in order to provide enhanced nesting opportunities for pisciverous (fish-eating) raptors.

ES.1.9.6 Point aux Pins Living Shoreline

The Point aux Pins Living Shoreline project will employ living shoreline techniques that utilize natural and/or artificial breakwater materials to stabilize shorelines along an area in Portersville Bay in the Mississippi Sound near Point aux Pins in Mobile County, Alabama. The project will be located adjacent to an existing living shoreline project previously constructed by the ADCNR utilizing other funding sources.

Construction activities will include placement of breakwater materials along the shoreline to dampen wave energy and reduce shoreline erosion while also providing habitat and increasing benthic secondary productivity. The specific breakwater elevations, construction techniques and design will be developed to maximize project success and meet regulatory requirements. Over time, the breakwaters are expected to provide habitat that supports benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, crabs, and small forage fishes.

ES.1.9.7 Shell Belt and Coden Belt Roads Living Shoreline

The Shell Belt and Coden Belt Roads Living Shoreline project will employ shoreline restoration techniques to increase benthic productivity and enhance the growth of planted native marsh vegetation. The project will be located in the Portersville Bay portion of Mississippi Sound, seaward of the southernmost portions of Shell Belt and Coden Belt Roads in Coden, Alabama. This project will be constructed to dampen wave energy and protect newly planted emergent vegetation while also providing habitat and increasing benthic secondary productivity. The specific breakwater elevations, construction techniques and design will be developed to maximize project success and meet regulatory requirements. Over time, the breakwaters are expected to develop into reefs that support benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, and crabs. Marsh vegetation is expected to become established further enhancing both primary and secondary productivity adjacent to the breakwaters.

ES.1.9.8 Seagrass Recovery Project at Gulf Islands National Seashore, Florida District

The Seagrass Recovery project at Gulf Islands National Seashore's Florida District will restore shallow seagrass beds in the Florida panhandle. It will restore .02 acres of seagrass injured by propeller scars, blow holes and human foot traffic, primarily in turtle grass (*Thalassia testudinum*) habitats on DOI-managed lands located along the south side of the Naval Live Oaks Preserve in Santa Rosa Sound, in Santa Rosa County, Florida. Project activities will include harvesting and transplanting seagrass, installing

bird stakes to condition sediments to promote seagrass survival, and installing signage to educate visitors about the restoration project and the ecological importance of seagrass.

ES.1.9.9 Sea Turtle Early Restoration

The Sea Turtle Early Restoration project is a multi-faceted approach to restoration that collectively addresses identified needs for a variety of species and life stages of sea turtles, consistent with long-term recovery plans and plan objectives for sea turtles in the Gulf of Mexico. The Sea Turtle Early Restoration project consists of four complementary project components:

- The Kemp's Ridley Sea Turtle Nest Detection and Enhancement project component will provide needed additional staff, infrastructure, training, education activities, equipment, supplies, and vehicles over a 10-year period in both Texas and Mexico for Kemp's ridley sea turtle nest detection and protection.
- The Enhancement of the Sea Turtle Stranding and Salvage Network (STSSN) and Development of an Emergency Response Program project component will enhance the existing STSSN beyond current capacities for 10 years in Texas and across the Gulf as well as develop a formal Emergency Response Program within the Gulf of Mexico.
- The Gulf of Mexico Shrimp Trawl Bycatch Reduction component will enhance two existing NOAA programs which will work to reduce the bycatch of sea turtles in shrimp trawls in the Gulf of Mexico. The two programs are the Gear Monitoring Team (GMT) and the Southeast Shrimp Trawl Fisheries Observer Program (Observer Program).
- The Texas Enhanced Fisheries Bycatch Enforcement component will enhance TPWD enforcement activities for fisheries that incidentally catch sea turtles while they operate primarily in Texas State waters within the Gulf of Mexico, for a 10-year period.

ES.1.9.10 Pelagic Longline Bycatch Reduction Project

The Pelagic Longline Bycatch Reduction Project will restore open-ocean (pelagic) fish that were affected by the spill. The Gulf pelagic longline (PLL) fishery primarily targets yellowfin tuna and swordfish, but incidentally catches and discards other fish, including marlin, sharks, bluefin tuna, and smaller individuals of the target species. The project aims to reduce the number of fish accidentally caught and killed in fishing gear by compensating PLL fishermen who agree to voluntarily refrain from PLL fishing in the Gulf during an annual six-month repose period that coincides with the bluefin tuna spawning season. The project will also provide participating fishermen with two alternative gear types to allow for the continued harvest of yellowfin tuna and swordfish during the repose period when PLL gear is not used.

ES.1.10 Severability of Phase IV Early Restoration Projects

In this Final Phase IV ERP/EA, the Trustees are selecting 10 specific Early Restoration projects expected to cost approximately $134 million. The Phase IV projects presented in this Final Phase IV ERP/EA are independent of each other and may be selected independently by the Trustees. A decision not to select one or more of the proposed projects in the Final Phase IV ERP/EA will not affect the Trustees' selection of the remaining Phase IV Early Restoration projects.

ES.1.11 Public Participation

The public comment period for the Draft Phase IV ERP/EA opened on May 20, 2015 (80 FR 29019), was extended for 17 days (80 FR 35393, June 19, 2015), and closed on July 6, 2015. During that time, the Trustees hosted six public meetings in Texas, Louisiana, Mississippi, Alabama, and Florida:

- June 2, 2015: Pensacola, Florida
- June 3, 2015: Mobile, Alabama
- June 4, 2015: Long Beach, Mississippi
- June 8, 2015: Belle Chasse, Louisiana
- June 10, 2015: Galveston, Texas
- June 11, 2015: Corpus Christi, Texas

At the public meetings, the Trustees accepted written comments, as well as verbal comments that were recorded by court reporters. In addition, the Trustees hosted a web-based comment submission site, and provided a P.O. Box and email address as other means for the public to provide comments. As a result, the Trustees received approximately 2,600 submissions from private citizens; businesses; federal, state, and local agencies; non-governmental organizations; and others.

Chapter 15 of this document provides further detail on the public comment process and includes a summary of all relevant public comments received on the Draft Phase IV ERP/EA and Trustee responses. This Final Phase IV ERP/EA reflects revisions to the Draft Phase IV ERP/EA arising from public comments; progress on compliance with other laws, regulations and Executive Orders; and continuing Trustee project development and consideration of potentially relevant information.

ES.1.12 Administrative Record

Pursuant to 15 C.F.R. § 990.45, the Trustees opened a publicly available Administrative Record for the NRDA for the Spill, including restoration planning activities, concurrently with the publication of the 2010 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.[8] Information about early restoration project implementation is being provided to the public through the Administrative Record and other outreach efforts, including http://www.gulfspillrestoration.noaa.gov.

ES.1.13 Remaining Milestones

The following is a list of milestones that will occur prior to implementation of Phase IV projects.

- File Stipulation Agreements with the Court

[8] Additionally, Louisiana is also maintaining an Administrative Record (see http://la-dwh.com/AdminRecord.aspx) in accordance with state regulations (La. Admin. Code 43:127).

Should future substantial changes or significant new circumstances arise, the Trustees would consider the need to supplement the relevant analyses.

Chapter 1: Introduction, Purpose and Need, and Public Participation

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1.1 Introduction

In July 2015, BP announced that it reached Agreements in Principle (AIPs) with the United States and the Gulf States of Alabama, Florida, Louisiana, Mississippi, and Texas for settlement of civil claims arising from the *Deepwater Horizon* oil spill. The terms of the proposed settlements are subject to a confidentiality order and will not become final until, among other things, a consent decree is negotiated, is made available for public review and comment, and is approved by the court. The Trustees expect the Early Restoration projects described in this document to go forward regardless of whether the proposed settlement is approved and, therefore, have proceeded with the finalization of the Phase IV ERP/EA.

On or about April 20, 2010, BP Exploration and Production Inc. (BP) was using Transocean's mobile offshore drilling unit *Deepwater Horizon* to drill a well in the Macondo prospect (Mississippi Canyon 252–MC252) when the well blew out, and the drilling unit exploded, caught fire and subsequently sank in the Gulf of Mexico (the Gulf). This incident resulted in an unprecedented volume of oil and other discharges from the rig and from the wellhead on the seabed. Tragically, 11 workers were killed and 19 injured. The *Deepwater Horizon* oil spill is the largest maritime oil spill in U.S. history, discharging millions of barrels of oil over a period of 87 days (hereafter referred to as "the Spill," which includes activities in response to the spilled oil). In addition, well over one million gallons of dispersants[1] were applied to the waters of the spill area in an attempt to disperse the spilled oil. An undetermined amount of natural gas was also released to the environment as a result of the Spill (National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling 2011).[2]

The U.S. Coast Guard responded and directed federal efforts to contain and clean up the Spill. At one point nearly 50,000 responders were involved in cleanup activities in open water, beach and marsh habitats. The scope, nature and magnitude of the Spill caused 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, including estuaries, shorelines and coastal marshes. Affected resources include ecologically, recreationally, and commercially important species and their habitats in the Gulf and along the coastal areas of Texas, Louisiana, Mississippi, Alabama, and Florida. These fish and wildlife species and their supporting habitats provide a number of important ecological and recreational use services.

Pursuant to the Oil Pollution Act (OPA), Title 33 United States Code (U.S.C.) §§ 2701 *et seq*., and the laws of individual affected states, federal and state agencies, Indian tribes and foreign governments act as

[1] Dispersants means those chemical agents that emulsify, disperse, or solubilize oil into the water column or promote the surface spreading of oil slicks to facilitate dispersal of the oil into the water column (40 C.F.R. 300 Subpart A).

[2] National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling. 2011. Deep Water: The Gulf Oil Disaster and The Future Of Offshore Drilling. Available at: http://www.gpo.gov/fdsys/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf.

trustees on behalf of the public to assess injuries to natural resources and their services[3] that result from an oil spill incident, and to 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 resources under their trusteeship (hereafter collectively referred to as "restoration"). This process of injury assessment and restoration planning is referred to as Natural Resource Damage Assessment (NRDA). OPA defines "natural resources" to include land, fish, wildlife, biota, air, water, ground water, drinking water supplies and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the Exclusive Economic Zone), any State or local government or Indian tribe, or any foreign government (33 U.S.C. § 2701(20)).

The Federal Trustees are designated pursuant to section 1006(b)(2) of OPA (33 U.S.C. § 2706(b)(2)) and Executive Orders 12777 and 13626. The following federal agencies are the designated natural resource Trustees under OPA for this Spill:[4]

- The United States Department of the Interior (DOI), as represented by the National Park Service (NPS), United States Fish and Wildlife Service (USFWS), and Bureau of Land Management (BLM);
- The National Oceanic and Atmospheric Administration (NOAA), on behalf of the United States Department of Commerce;
- The United States Department of Agriculture (USDA); and
- The United States Environmental Protection Agency (EPA).

State Trustees are designated by the governor of each state pursuant to section 1006(b)(3) of OPA (33 U.S.C. § 2706(b)(3)). The following state agencies are designated natural resources Trustees under OPA and are currently acting as Trustees for the Spill:

- Texas Parks and Wildlife Department (TPWD), Texas General Land Office (TGLO) and Texas Commission on Environmental Quality (TCEQ);
- The State of Louisiana's Coastal Protection and Restoration Authority (CPRA), Oil Spill Coordinator's Office (LOSCO), Department of Environmental Quality (LDEQ), Department of Wildlife and Fisheries (LDWF) and Department of Natural Resources (LDNR);
- The State of Mississippi's Department of Environmental Quality (MDEQ);
- The State of Alabama's Department of Conservation and Natural Resources (ADCNR) and Geological Survey of Alabama (GSA); and
- The State of Florida's Department of Environmental Protection (FDEP) and Fish and Wildlife Conservation Commission (FWC).

This document (Final Phase IV ERP/EA), prepared jointly by State and Federal Trustees, serves as a Final Phase IV Early Restoration Plan under OPA, and also contains the associated assessment for each

[3] Services (or natural resource services) means the functions performed by a natural resource for the benefit of another natural resource and/or the public (15 C.F.R. § 990.30).

[4] The U.S. Department of Defense is a trustee under OPA of natural resources at its Gulf Coast facilities potentially affected by the Spill but is not a member of the Trustee Council and did not participate in the preparation of this document.

proposed project under the National Environmental Policy Act (NEPA). Consistent with the Phase III Early Restoration Plan and Programmatic Environmental Impact Statement (Final Phase III ERP/PEIS), the DOI is the lead federal agency for preparing the Final Phase IV ERP/EA. The Federal co-Trustees are cooperating agencies pursuant to NEPA (40 C.F.R. §1508.5). As discussed in Chapter 4, these cooperating federal agencies intend to adopt these EAs, once completed. This document is prepared in accordance with 40 C.F.R. Parts 1500-1508, "CEQ's Regulations for Implementing NEPA" and DOI NEPA implementing regulations (43 C.F.R. Part 46).

In addition to acting as Trustees for this incident under OPA, the States of Texas, Louisiana, Mississippi, Alabama and Florida are also acting pursuant to their applicable state laws and authorities, including but not limited to:

- The Texas Oil Spill Prevention and Response Act of 1991, Tex. Nat. Res. Code, Chapter 40;
- 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 Mississippi Air and Water Pollution Control Law, Miss. Code Ann. §§ 49-17-1 through 49-17-43;
- Alabama Code §§ 9-2-1 *et seq.* and §§9-4-1 *et seq.*;
- The Florida Pollutant Discharge Prevention and Removal Act, Fla. Stat., Section 376.011 *et seq.*

State and Federal natural resource Trustees (the Trustees) are in the process of assessing and quantifying injuries to natural resources and to services provided by those resources caused by the Spill. The information from this process will guide the Trustees' future identification of restoration projects to compensate the public for those resource injuries and losses. While the NRDA for the Spill is ongoing, the Trustees and BP have begun a process of "Early Restoration" – whereby the Trustees begin the process of restoring injured resources and services prior to the completion of the NRDA process (Section 1.2 below provides additional information about the "Framework Agreement" that established the Early Restoration process for the Spill). To date, three phases of Early Restoration have been planned and 54 restoration projects with a total cost of approximately $698 million have been selected for implementation.[5] Early Restoration Plans and assessments of environmental impacts were prepared for Phase I and Phase II.[6] For Phase III, the Trustees prepared a Phase III Early Restoration Plan (which included project-specific environmental reviews) as well as a Programmatic Early Restoration Plan and Environmental Impact Statement (Final Phase III ERP/PEIS).[7]

This Final Phase IV ERP/EA serves as an Early Restoration Plan and Environmental Assessments for an additional 10 Early Restoration projects. These projects have a total estimated cost of approximately $134 million. The Trustees continue to identify and develop additional Early Restoration projects to take full advantage of the Early Restoration funds available under the Framework Agreement. Any additional

[5] $698 million = $62 million (Phase I) + $9 million (Phase II) + $627 million (Phase III).

[6] Phase I: http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/Final-ERP-EA-041812.pdf; Phase II: http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/Phase-II-ERP-ER-12-21-12.pdf

[7] http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/phase-iii/

projects that are proposed and selected will be included in subsequent Restoration plans to be released at a future date. The remainder of this chapter describes the Framework Agreement, the relationship of this document to the Final Phase III ERP/PEIS and purpose and need for Early Restoration. It also provides additional background and contextual information relevant to the objectives, content and organization of this Final Phase IV ERP/EA. The present document also provides notice of change in Section 1.7 to one Phase III Early Restoration Project: Enhancement of Franklin County Parks and Boat Ramps – Eastpoint Fishing Pier Improvements – in Florida.

1.2 Early Restoration Framework Agreement

The Early Restoration planning process is designed to be a cooperative endeavor between the Trustees and parties responsible for the Spill. On April 20, 2011, BP agreed to provide up to $1 billion toward Early Restoration projects in the Gulf of Mexico to address injuries to natural resources caused by the Spill. This Early Restoration agreement, entitled "Framework for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill" (Framework Agreement), represents a preliminary 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 injury 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 the resolution of the Trustees' natural resource damages claim. Early restoration is not intended to, and does not fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects will be required to fully compensate the public for all natural resource losses, including recreational use losses from the *Deepwater Horizon* oil spill. The Trustees have engaged the public in a separate process to develop a plan to fully address all restoration that will be needed. This process is described in Section 2.1.1 (Early Restoration Project Solicitation and Public Participation) of the Final Phase III ERP/PEIS.

The Early Restoration planning process is part of the NRDA, but is also shaped in part by the Framework Agreement with BP. The Framework Agreement is a partial, interim settlement under which BP is making up to $1 billion available for restoration before completion of the NRDA and before any final resolution of its liability, in return for agreed offsets ("NRD Offsets" explained later in this document) to be applied by the Trustees in the future against their total assessment of injury. This provides an opportunity for the Trustees to make progress towards restoration while the steps needed to determine the full amount of injury and natural resource damage unfold. At the same time, under the Framework Agreement, a proposed Early Restoration project may be funded only if all of the Trustees, the U.S. Department of Justice, and BP agree on, among other things, the amount of funding to be provided by BP and the Offsets against injury or service losses attributable to that project. The need for project-specific agreements inevitably affects which projects are practical to pursue in the Early Restoration process.

By its nature, the Early Restoration process is not intended to accomplish full restoration. Early Restoration projects represent an initial step toward fulfilling the responsible parties' obligation to pay for restoration of injured natural resources. Ultimately, the responsible parties are obligated to

compensate the public for the full scope of natural resource injuries caused by the Spill, including the cost of assessment and restoration planning.

1.3 Relationship of Phase IV ERP/EA to the Final Phase III ERP/PEIS

The Trustees are selecting, in this Final Phase IV ERP/EA, 10 projects in accordance with OPA and under the Framework Agreement that are meant to continue implementation of Early Restoration for the purpose of accelerating meaningful restoration of injured natural resources and their services resulting from the Spill.

Given the potential magnitude and breadth of further Early Restoration, the Trustees previously prepared a Programmatic Early Restoration Plan (Programmatic ERP) and PEIS under OPA and NEPA to analyze alternative approaches to continuing Early Restoration and to consistently guide remaining Early Restoration decisions. The programmatic approach was taken to assist the Trustees in their development and evaluation, and to assist the public in its review of future Early Restoration projects. The 10 projects in this Final Phase IV ERP/EA are consistent with in the programmatic analysis addressed in the Final Phase III ERP/PEIS previously developed by the Trustees, as summarized below.

The regulations that guide NRDAs under OPA require that restoration planning actions undertaken by Federal Trustees comply with the NEPA, 42 U.S.C. §§ 4321 et seq., and the regulations guiding its implementation at 40 C.F.R. Parts 1500-1508 (15 C.F.R. § 990.23). NEPA and its implementing regulations outline the responsibilities of federal agencies, including the preparation of environmental impact analysis such as an environmental impact statement.

A federal agency may prepare a PEIS to evaluate broad actions (40 C.F.R. § 1502.4(b); *see* Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 FR 18026 (1981)). When a federal agency prepares a programmatic NEPA analysis, such as a PEIS, the agency may "tier" subsequent, narrower environmental analyses on site-specific plans or projects from the programmatic analysis (40 C.F.R. § 1502.4(b); 40 C.F.R. §1508.28). Federal agencies are encouraged to tier subsequent, narrower analyses from a programmatic NEPA analysis to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review (40 C.F.R. § 1502.20).

Department of the Interior regulations (43 CFR 46.140, "Using tiered documents") authorize tiering under certain circumstances:

(a) Where the impacts of the narrower action are identified and analyzed in the broader NEPA document, no further analysis is necessary, and the previously prepared document can be used for purposes of the pending action.

(b) To the extent that any relevant analysis in the broader NEPA document is not sufficiently comprehensive or adequate to support further decisions, the tiered NEPA document must explain this and provide any necessary analysis.

(c) An environmental assessment prepared in support of an individual proposed action can be tiered to a programmatic or other broader-scope environmental impact statement. An environmental assessment may be prepared, and a finding of no significant impact reached, for a proposed action with significant effects, whether direct, indirect, or cumulative, if the environmental assessment is tiered to a broader environmental impact statement which fully analyzed those significant effects. Tiering to the programmatic or broader-scope environmental impact statement would allow the preparation of an environmental assessment and a finding of no significant impact for the individual proposed action, so long as any previously unanalyzed effects are not significant. A finding of no significant impact other than those already disclosed and analyzed in the environmental impact statement to which the environmental assessment is tiered may also be called a "finding of no *new* significant impact."

A programmatic NEPA analysis may consider multiple related federal actions that may encompass a large geographic scale or that constitute a suite of similar programs, both of which apply to the joint state and federal Early Restoration effort to restore natural resources and services that were impacted by the Spill. The Trustees elected to prepare a PEIS to support analysis of the environmental consequences of the Programmatic ERP, to consider the multiple related actions that may occur as a result of Early Restoration, and to allow for a better analysis of cumulative impacts of potential actions.

For the Programmatic ERP, the Trustees developed a set of project types for inclusion in programmatic alternatives, consistent with the desire to seek a diverse set of projects providing benefits to a broad array of potentially injured resources and services they provide.[8] Ultimately, this process resulted in the inclusion of 12 project types in the programmatic alternatives evaluated for Early Restoration, including:

1. Create and Improve Wetlands
2. Protect Shorelines and Reduce Erosion
3. Restore Barrier Islands and Beaches
4. Restore and Protect Submerged Aquatic Vegetation
5. Conserve Habitat
6. Restore Oysters
7. Restore and Protect Finfish and Shellfish
8. Restore and Protect Birds
9. Restore and Protect Sea Turtles
10. Enhance Public Access to Natural Resources for Recreational Use
11. Enhance Recreational Experiences
12. Promote Environmental and Cultural Stewardship, Education and Outreach

While the 12 project types can be combined in numerous ways to develop programmatic alternatives, the Trustees considered and evaluated four programmatic alternatives in the Final Phase III ERP/PEIS, ultimately selecting Alternative 4: Contribute to Restoring Habitats, Living Coastal and Marine

[8] Project type names, descriptions, and the resources benefitted are not necessarily indicative of NRD Offsets agreed upon with BP for any particular project pursuant to the Framework Agreement. Offset types and the relationship to projects in this Final ERP are described in Chapters 5-14 of this document and Appendix C. Future proposed projects, even if similar to those proposed herein or within the same project type, may bear different proposed NRD Offsets.

Resources, and Recreational Opportunities (which includes project types 1-12 above) in the" Record of Decision for the Deepwater Horizon Oil Spill: Final Programmatic and Phase III Early Restoration Plan and Early Restoration Programmatic Environmental Impact Statement (Phase III ERP/PEIS)" (October 2014 ROD). As further described throughout this document, the Phase IV projects are consistent with the Trustees' selected programmatic alternative.

This Final Phase IV ERP/EA is tiered from the programmatic portions (Chapters 3, 5, and 6 as well as associated appendices) of the Final Phase III ERP/PEIS (40 C.F.R. § 1508.28) which is incorporated here by reference (40 C.F.R. § 1502.21).[9] The programmatic analyses included in the Final Phase III ERP/PEIS streamline Early Restoration planning by evaluating broad issues and impacts associated with all project types included in the programmatic plan, thereby allowing the Trustees to tier project-specific analyses from the programmatic analyses. Tiering project-specific analyses reduces or eliminates duplicative documentation by focusing project analyses on project-specific issues and incorporating by reference the issues evaluated in the broad programmatic analyses. For Phase IV Early Restoration projects, the Trustees have considered the extent to which additional NEPA analyses may be necessary for the projects that tier from the PEIS, including whether the analyses of relevant conditions and environmental effects described in the PEIS are still valid or whether projects have been considered in separate analyses under NEPA for purposes of other federal processes. These considerations are addressed in the project-specific environmental reviews included in this document (see Chapters 5-14).

1.4 Early Restoration Purpose and Need

Phase IV of Early Restoration continues to fall within the scope of the purpose and need identified in the Final Phase III ERP/PEIS (see Chapter 1). This purpose and need is reproduced below and has been updated to include total project costs from Phase III.

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 recover to baseline conditions (compensatory restoration). NRDA restoration planning has two basic components: (1) injury assessment and (2) restoration selection. Given its expansive geographic scale and complexity, the *Deepwater Horizon* NRDA process may continue for several more years. Therefore, for the purpose of accelerating meaningful restoration of injured natural resources and their services resulting from the Spill, the Trustees propose to continue implementation of Early Restoration in accordance with OPA and the Final Phase III ERP/PEIS, using funds made available in the Framework Agreement. Having completed three emergency restoration projects as well as initiated three previous phases of Early Restoration, with 54 projects totaling $698 million, the Trustees are herein proposing an additional 10 Early Restoration projects worth approximately $134 million for Phase IV of Early Restoration. Early Restoration is being initiated prior to completion of the full NRDA, and is not intended to fully address all injuries caused by the Spill. Additional projects will continue to be proposed in subsequent phase(s) of Early Restoration as well as in the complete NRDA.

[9] The Final Phase III ERP/PEIS is available at: http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/phase-iii/.

1.5 Phase IV Project Selection Process and Alternatives

The Trustees developed the Early Restoration selection process to be responsive to the purpose and need for conducting Early Restoration. In summary, Early Restoration project selection is a step-wise process comprised of: (1) project solicitation; (2) project screening; (3) negotiation with BP; and (4) evaluation and environmental review of proposed projects under OPA and NEPA, including public review and comment.

The Trustees' Early Restoration project selection process initially results in a set of potential projects that, consistent with the Framework Agreement, are submitted to BP for review and discussion. The Framework Agreement requires the Trustees and BP to agree on: (1) the funding amount for a proposed project; and (2) Offsets. If the Trustees and BP reach agreement in principle on project terms, those projects are incorporated into a Draft Early Restoration Plan and are subject to NEPA review. Projects can be considered ready for implementation only after consideration of comments submitted during the public review process, finalization of the Early Restoration Plan, completion of all required permits and environmental compliance reviews including NEPA, and execution and filing of the project stipulations.

With respect to the 10 projects in the Phase IV ERP/EA, as with previous phases of Early Restoration, the Trustees identified potential projects from many sources, including but not limited to: submissions from the public; Gulf restoration reports, research, management plans and related efforts; and Trustee information collection activities. The Trustees applied a screening process to be responsive to the purpose and need for conducting Early Restoration based on specified evaluation criteria and practical considerations that, while not legally mandated, are nonetheless useful and permissible to help screen potential projects. Additional information about the process that individual State Trustees used to screen potential projects is also included, as relevant, in Chapters 5-14. Individual Trustees identified preliminary lists of projects that were then brought to all of the Trustees for collective consideration and approval to proceed with project negotiations with BP.

NOAA and DOI applied the following additional restoration evaluation criteria to identify potential projects:

- DOI identified projects that would take place both on and off DOI-managed lands. DOI has significant experience implementing restoration projects on lands managed by DOI, which allows DOI to predict costs and project success with a relatively high degree of confidence. Additionally, the Spill injured natural resources and related services on several of the National Wildlife Refuges and National Parks. Consequently, DOI prioritized some restoration projects that would be implemented on these National Wildlife Refuges and National Parks. For projects that would not take place on DOI-managed lands, DOI has sought to partner with other Trustees to propose and implement Early Restoration projects that address injuries and comply with project evaluation criteria.
- NOAA's project screening process included the application of the restoration evaluation criteria, as well as identification of projects that would restore injuries specifically to NOAA trust resources. Further, NOAA prioritized projects that would have benefits to both nearshore and offshore trust resources. NOAA sought to partner with other Trustees to propose and

implement Early Restoration projects that address injuries to NOAA trust resources, and comply with the project evaluation criteria.

A more detailed description of NRDA restoration planning; requirements set forth by the OPA, NEPA, the Early Restoration Framework Agreement and other applicable authorities; and each step in the Early Restoration project selection process can be found in the Final Phase III ERP/PEIS (in particular, see Chapters 1 and 2).

1.6 Previous Phases of Early Restoration

The Trustees previously selected 54 Early Restoration projects for implementation, including: eight projects documented in the April 2012 final "*Deepwater Horizon* Oil Spill Phase I Early Restoration Plan and Environmental Assessment"; two projects documented in the December 2012 final "*Deepwater Horizon* Oil Spill Phase II Early Restoration Plan and Environmental Review"; and 44 projects documented in the June 2014 final "*Deepwater Horizon* Oil Spill: Programmatic and Phase III Early Restoration Plan and Early Restoration Programmatic Environmental Impact Statement".

As summarized in Table 1-1, the total estimated cost of Early Restoration projects selected for implementation to date is approximately $698 million (including contingencies). Ecological projects comprise $460 million (66%) of this total, and recreational projects comprise the remaining $238 million (34%). Within the ecological project category, barrier island restoration and dune projects account for $321 million of estimated project costs, followed by marsh and living shoreline projects ($92 million), oyster projects ($35 million), sea turtle and bird habitat enhancement projects ($9 million), and seagrass projects ($3 million).

For more information about previously selected Early Restoration projects, please see the relevant restoration planning document(s) cited above.

Table 1-1. Summary of Funds Spent on Phase I, II, and III Early Restoration Project Categories

PROJECT CATEGORY	ESTIMATED COST FOR ALL PROJECTS IN THAT CATEGORY
Barrier Islands and Dunes	$321,098,721
Recreational	$237,628,642
Marsh and Living Shoreline	$92,283,748
Oyster	$35,192,681
Sea Turtle and Bird Habitat Enhancement	$8,979,283
Seagrasses	$2,691,867
Total	**$697,874,942**

1.7 Notice of Change to one Phase III Early Restoration Project: Enhancement of Franklin County Parks and Boat Ramps – Eastpoint Fishing Pier Improvements Component (Florida)

The Final Phase III ERP/PEIS stated that the Early Restoration project Eastpoint Fishing Pier in Franklin County, Florida included the construction of a restroom facility at the base of the public fishing pier. That facility is described as utilizing a holding tank that would need to be pumped out regularly. In addition to the restroom facility, the project also includes a kiosk describing fishing ethics, litter control, and the important resources surrounding the pier (primarily commercial oyster bars). Since selection of this project in the Final Phase III ERP/PEIS, in initial planning for project implementation, it was learned that the design of the restroom facility would be changing from using a holding tank requiring regular pump out to using a holding tank and grinder pump system, which would be connected to the existing sewer infrastructure approximately 2/3 of a mile away. Section 9.2 of the October 2014 ROD for the Final Phase III ERP/PEIS describes criteria the Trustees will consider to evaluate material changes to any selected Phase III Early Restoration project to determine whether additional restoration planning and environmental review, including opportunity for public comment, is necessary. First, the Trustees will determine whether any change to the project is consistent with the environmental review in the Final Phase III ERP/PEIS or if there are substantial changes that are relevant to environmental concerns. Second, the Trustees will assess whether or not there are significant new circumstances or information relevant to environmental concerns not addressed in the impact analysis of the Final Phase III ERP/PEIS (40 C.F.R. § 1502.9 (c)). Third, the Trustees will evaluate whether changes to the project result in changes to the project description in the Final Phase III ERP/PEIS that affects their selection under OPA. The Trustees' evaluation of this project change is provided in Appendix A of this document. After considering these criteria in relation to the identified change, the Trustees have determined that the change to the Eastpoint Fishing Pier Improvements component does not impact the overall "Enhancement of Franklin County Parks and Boat Ramps" project objective (which is to enhance and/or increase recreational fishing and boating opportunities by improving two existing fishing piers, an existing boat launch facility, and an existing waterfront park), that the environmental consequences of the change to the Eastpoint Fishing Pier Improvements component will not be substantial, and that the change does not present significant new circumstances or information pursuant to the first two criteria. Consequently, the Trustees find the project change does not affect the Trustees' selection of the project under OPA or the environmental analysis under NEPA in the Final Phase III ERP/PEIS.

Accordingly, the Trustees are providing notice of the change to the public: a holding tank and grinder pump system, which will be connected to the existing sewer infrastructure approximately 2/3 of a mile away, is replacing the waste disposal feature previously described. The restroom will still be built at the base of the public fishing pier and the kiosk will still be constructed as well.

1.8 Phase IV Projects

Based on the project selection process outline above, and in accordance with the Final Phase III ERP/PEIS, the Trustees are selecting 10 projects for inclusion in Phase IV of Early Restoration. Chapter 4 provides summary information about the projects, and Chapters 5-14 provide more detailed information, including the tiered NEPA analyses for these projects. The Phase IV ERP will not exhaust

potential Early Restoration funding. Even with selection of all the Phase IV projects, there will still be approximately $134 million in Early Restoration funding not yet allocated to projects.

The Trustees note that the NRDA is still a work in progress. The Early Restoration process is not intended to accomplish full restoration. However, the Trustees do not view interim inaction on restoration as the right response to the present unknowns or uncertainties about the full extent of the resource injuries and losses. An accounting of whether the Early Restoration actions selected by the Trustees adequately address all categories of natural resource injury and service losses must await completion of the NRDA and must consider both the Early Restoration projects and the final, comprehensive damages assessment and restoration plan.

1.9 Severability of Phase IV Projects

In the Final Phase IV ERP/EA, the Trustees are selecting 10 specific Early Restoration projects expected to cost approximately $134 million. As discussed in more detail in Chapter 4, the Phase IV projects presented in this Final Phase IV ERP/EA are independent of each other and may be selected independently by the Trustees. A decision not to select one or more of the projects in Phase IV will not affect the Trustees' selection of the remaining Phase IV Early Restoration projects.

1.10 Public Participation

1.10.1 Public Participation Prior to the Draft Phase IV ERP/EA

OPA, NEPA and the Framework Agreement require the Trustees to consider public comments on the restoration planning process associated with the Spill. For each phase of Early Restoration, the Trustees have developed draft restoration plans for public review and comment and have held public meetings prior to finalizing projects.

A Notice of Intent to Conduct Restoration Planning for the *Deepwater Horizon* Oil Spill (2010 NOI) was published in the Federal Register on October 1, 2010 and announced publicly by the Trustees (Discharge of Oil from *Deepwater Horizon*/Macondo Well, Gulf of Mexico, Intent to Conduct Restoration Planning, 75 Fed. Reg. 60,800 (October 1, 2010)). Pursuant to 15 C.F.R. § 990.44, the 2010 NOI 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 Spill.

In planning for Phase I and Phase II of Early Restoration, the Trustees prepared and released draft plans for public review and comment, and considered all public comments received before approving the final Phase I and Phase II plans in April 2012 and December 2012, respectively.

A Notice of Intent to Prepare a Programmatic Environmental Impact Statement for a Phase III Early Restoration Plan and Early Restoration Project Types, and to Conduct Scoping Meetings (2013 NOI) was published in the Federal Register (78 Fed. Reg. 33431-33432 (June 4, 2013)) and announced publicly by the Trustees. Pursuant to NEPA, OPA, and the implementing Natural Resource Damage Assessment regulations found at 15 CFR Part 990, the 2013 NOI announced that the Trustees intended to prepare a

PEIS under NEPA to evaluate the environmental consequences of Early Restoration project types, as well as the Early Restoration projects that the Trustees intended to propose in a Draft Phase III Early Restoration Plan. The programmatic evaluation of Early Restoration project types in the PEIS was intended to allow the Trustees to better analyze cumulative effects of Early Restoration, and to tier NEPA analyses for future Early Restoration plans to the PEIS, where appropriate.

The Trustees also established websites to provide the public information about injury and restoration processes,[10] and public solicitation of restoration projects has been ongoing since publication of the 2010 NOI. The Trustees have received hundreds of proposals, all of which can be viewed at several web pages (see footnote 10). The public provided ideas and comments at public meetings focused on the PEIS for the final, comprehensive damages assessment and restoration plan as well as during public meetings held during each phase of Early Restoration.

OPA, NEPA and the Framework Agreement require the Trustees to consider public comments on the restoration planning process associated with the Spill. For each phase of Early Restoration, the Trustees have developed draft restoration plans for public review and comment and have held public meetings prior to finalizing projects. The Draft Phase I ERP/EA, the Draft Phase II ERP/ER, and the Draft Phase III ERP/PEIS served as proposed restoration plans for Early Restoration, environmental review of the projects under NEPA, and the means used by the Trustees to seek public review and comment during Phases I, II and III. Public meetings were held to facilitate the public review and comment. A complete record of the public meetings and input opportunities is available at http://www.gulfspillrestoration.noaa.gov.

1.10.2 Public Participation on the Draft Phase IV ERP/EA

The public comment period for the Draft Phase IV ERP/EA opened on May 20, 2015 (80 FR 29019), was extended for 17 days (80 FR 35393, June 19, 2015), and closed on July 6, 2015. During that time, the Trustees hosted six public meetings in Texas, Louisiana, Mississippi, Alabama, and Florida:

- June 2, 2015: Pensacola, Florida
- June 3, 2015: Mobile, Alabama

[10] The Trustees established the following websites:

- NOAA, Gulf Spill Restoration, available at http://www.gulfspillrestoration.noaa.gov/;
- NOAA, DIVER, available at https://dwhdiver.orr.noaa.gov/
- DOI, *Deepwater Horizon* Oil Spill Response, available at http://www.fws.gov/home/dhoilspill/;
- Texas Parks and Wildlife Department, *Deepwater Horizon* Oil Spill, available at http://www.tpwd.state.tx.us/landwater/water/environconcerns/damage_assessment/deep_water_horizon.phtml/;
- Louisiana, *Deepwater Horizon* Oil Spill Natural Resource Damage Assessment, available at http://la-dwh.com/;
- Mississippi Department of Environmental Quality, Natural Resource Damage Assessment, available at http://www.restore.ms/;
- Alabama Department of Conservation and Natural Resources, NRDA Projects, available at http://www.alabamacoastalrestoration.org; and
- Florida Department of Environmental Protection, *Deepwater Horizon* Oil Spill Response and Restoration, available at http://www.dep.state.fl.us/deepwaterhorizon/default.htm.

- June 4, 2015: Long Beach, Mississippi
- June 8, 2015: Belle Chasse, Louisiana
- June 10, 2015: Galveston, Texas
- June 11, 2015: Corpus Christi, Texas

At the public meetings, the Trustees accepted written comments, as well as verbal comments that were recorded by court reporters. In addition, the Trustees hosted a web-based comment submission site, and provided a P.O. Box and email address as other means for the public to provide comments. As a result, the Trustees received approximately 2,600 submissions from private citizens; businesses; federal, state, and local agencies; non-governmental organizations; and others.

Chapter 15 of this document provides further detail on the public comment process and includes a summary of all relevant public comments received on the Draft Phase IV ERP/EA and Trustee responses. This Final Phase IV ERP/EA reflects revisions to the Draft Phase IV ERP/EA arising from public comments; progress on compliance with other laws, regulations and Executive Orders; and continuing Trustee project development and consideration of potentially relevant information.

1.11 Document Organization and Decisions to be Made

Consistent with the purpose and need and proposed actions identified above, this Final Phase IV ERP/EA is divided into the following chapters:

- **Chapter 1 (Introduction, Purpose and Need, and Public Participation)**: Introductory information and context for the Final Phase IV ERP/EA;
- **Chapter 2 (Affected Environment and Environmental Setting)**: Information describing the affected environment within which the Early Restoration activities are expected to take place;
- **Chapter 3 (The *Deepwater Horizon* Oil Spill Natural Resource Injury Assessment)**: A summary of the status of *Deepwater Horizon* Oil Spill Natural Resource Injury Assessment efforts;
- **Chapter 4 (Introduction to Phase IV Early Restoration Projects)**: Identifies projects and provides brief, summary information about them;
- **Chapters 5-14 (Evaluation of Phase IV Restoration Projects):** OPA and NEPA analyses related to the 10 specific projects proposed by the Trustees for implementation in Phase IV of Early Restoration;
- **Chapter 15 (Public Comment on the Draft Phase IV ERP/EA and Responses)**: Summary of all relevant public comments received on the Draft Phase IV ERP/EA and Trustee responses;
- **List of Preparers**: Identification of individuals who substantively contributed to the development of this document;
- **List of Repositories**: A list of facilities that will receive copies of the Phase IV Early Restoration Plan/Environmental Assessments for review by the public;
- **Appendix A** (**Evaluation of Change to the Phase III Early Restoration Project: Enhancement of Franklin County Parks and Boat Ramps – Eastpoint Fishing Pier Improvements)**;
- **Appendix B** (**Phase IV Early Restoration Project Monitoring Plans)**: Project-specific monitoring plans for each Phase IV project;

- **Appendix C (Additional Phase IV Project Offset Information)**: Additional offset information for some Phase IV projects;
- **Appendix D** (**Guidelines for NEPA Impact Determinations from the Final Phase III ERP/PEIS**): Guidelines for resource-specific definitions for determining effects of individual planned actions;
- **Appendix E (Statements of Findings Related to DOI Bike and Pedestrian Use Enhancement Project at Gulf Islands National Seashore)**: A Floodplain Statement of Findings (FSOF) and a Wetlands Statement of Findings (WSOF); and
- **Appendix F (2011 National Park Service EA "Expansion of Facilities Supporting Sea Turtle Science and Recovery, Construction of Patrol Cabins and Expansion of Incubation Laboratory, 2011.")**

This document is intended to provide the public and decision-makers with information and analysis on the Trustees' proposal to proceed with the selection and implementation of up to 10 individual Phase IV Early Restoration projects.

The public, government agencies, and other entities have identified and continue to identify a large number of potential restoration projects for consideration during the restoration planning process. Projects not identified for inclusion in the Final Phase IV ERP/EA may continue to be considered for inclusion in future restoration plans.

1.12 Administrative Record

Pursuant to 15 C.F.R. § 990.45, the Trustees opened a publicly available Administrative Record for the NRDA for the Spill, including restoration planning activities, concurrently with the publication of the 2010 NOI. DOI is the lead Federal Trustee for maintaining the Administrative Record, which can be found at http://www.doi.gov/deepwaterhorizon/adminrecord.[11] Information about Early Restoration project implementation is being provided to the public through the Administrative Record and other outreach efforts, including http://www.gulfspillrestoration.noaa.gov.

1.13 Remaining Milestones

The following is a list of milestones that will occur prior to implementation of Phase IV projects.

- File Stipulation Agreements with the Court

Should future substantial changes or significant new circumstances arise, the Trustees would consider the need to supplement the relevant analyses.

[11] Additionally, Louisiana is also maintaining an Administrative Record (see http://la-dwh.com/AdminRecord.aspx) in accordance with state regulations (La. Admin. Code 43:127).

Chapter 2: Affected Environment and Environmental Setting

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2.4 Human Uses and Socioeconomics 2

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2.1 Introduction

The purpose of this chapter is to describe the environment of the area(s) to be affected by the proposed projects under consideration (40 C.F.R. §1502.15). This chapter provides the overall physical, biological and socioeconomic context within which proposed projects would occur. The description of the affected environment includes areas that may be affected by presently proposed Early Restoration actions. Although OPA NRDA regulations do not constrain the geographic location of restoration projects, the affected environment for purposes of this Final Phase IV ERP/EA is the "northern Gulf of Mexico," which includes the U.S. portion of the Gulf extending from the southern tip of Texas eastward to the Florida Keys, following the coastline of Texas, Louisiana, Mississippi, Alabama, and Florida. Similarly, the "northern Gulf Coast" includes the coastline of Texas, Louisiana, Mississippi, Alabama, and Florida. This area is comprised of complex biological communities of interacting organisms, including humans, and their physical environment(s). The site-specific affected environment for each proposed project is described in greater detail in the project-specific chapters of this document (see Chapters 5 through 14).

Chapter 13, Sea Turtle Early Restoration Project, describes a component of the proposed project that takes place on beaches in Mexico to help protect the eggs and nests of Kemp's ridley sea turtles. Sea turtle nest detection activities have taken place on the beaches in Mexico for many years with success. The affected environment for nesting sea turtles in the northern Gulf Coast is generally the same as the affected environment for nesting sea turtles on beaches in Mexico. Therefore, the affected environment description applies to the northern Gulf Coast and the relevant beaches in Mexico.

As described in Chapter 3, the Trustees assessment of injuries caused by the Spill to natural resources and the services provided by these resources is ongoing. The spatial scope of the assessment includes the northern Gulf of Mexico region. The assessment work to date clearly demonstrates areas of extensive oiling of marsh and beach shorelines from Texas to the Florida Panhandle. Preliminary results also make clear that the oiling has had substantial adverse impacts on coastal and nearshore habitats and their biological communities. In addition, initial results from the Trustees' assessment clearly show that oiling caused very large reductions in coastal recreation from Texas to Florida. The Trustees consider injuries caused by the Spill to be part of the affected environment for purposes of this Final Phase IV ERP/EA.

A detailed discussion of the affected environment is included in Chapter 3 of the Final Phase III ERP/PEIS and that discussion is incorporated by reference within this Final Phase IV ERP/EA. A brief summary, including the resources described in the affected environment section of the Final Phase III ERP/PEIS is provided below. Updates to the affected environment since implementation of the Final Phase III ERP/PEIS are described below in Section 2.5. In general, these updates provide additional environmental context relevant to proposed Phase IV projects or information about regulatory changes that may affect Trustee identification, analysis and/or evaluation of proposed Phase IV projects.

2.2 Physical Environment

The Gulf of Mexico is a large basin. Its greatest east-west and north-south extents are approximately 1,100 and 800 miles, respectively, with a surface area of approximately 600,000 square miles, and containing approximately 584,000 cubic miles of water. The basin is bordered by Cuba, Mexico, and the

United States (U.S.), and consists of an intertidal zone, continental shelf, continental slope, and abyssal plain. The northern Gulf of Mexico is dominated by inputs from the Mississippi River Basin (MRB), which drains 41% of the contiguous U.S. and contributes 90% of the freshwater entering the Gulf (U.S. EPA 2011). These inflows provide the nutrients and hydrological conditions that make the northern Gulf of Mexico one of the most unique natural areas in the world. The description of the physical environment of the northern Gulf includes information on the geology and substrates, hydrology and water quality, air quality, and noise characteristics of the area.

Physical resources described in the Affected Environment section of the Final Phase III ERP/PEIS are: Geology and Substrates including Upland Geology and Soil as well as Nearshore Coastal Geology and Sediment; Hydrology and Water Quality including Freshwater Environments (Groundwater, Surface Water, Mississippi River Basin, and the Gulf Intracoastal Waterway) and the Coastal Water Environment (Nearshore Coastal Environment, Marine Environment); Air Quality including Climate; and Noise.

2.3 Biological Environment

The northern Gulf of Mexico contains a range of habitats that support diverse and productive ecosystems, with both nursery and feeding grounds for ecologically and economically important species (GCERTF 2011). The biological environment of the northern Gulf of Mexico can be divided into two broad categories: habitats and living coastal and marine resources. The northern Gulf Coast contains a variety of habitats including wetlands (e.g., mudflats, salt pannes, tidal flats, forested wetlands, pine savannas, riparian forests, swamps, and mangroves), barrier islands, beaches and dunes, submerged aquatic vegetation (SAV) beds, and other habitats in the coastal environment. These habitats support thousands of marine and terrestrial species, including more than 15,000 marine species (many of which are globally significant resources), and dozens of threatened or endangered fish, reptiles, birds, and mammals (NOAA 2011 and USFWS 2012). This high level of diversity in both habitat types and species increases the productivity and stability of the Gulf Coast (Brown et al. 2011).

Biological resources described in the Affected Environment section of the Final Phase III ERP/PEIS are: Habitats and Living Coastal and Marine Resources (including Nearshore Benthic Communities, Oysters, Pelagic Microfaunal Communities, Sargassum, Finfish, Sea Turtles, Marine Mammals, Birds, and Terrestrial Wildlife).

2.4 Human Uses and Socioeconomics

Millions of people live, work, and recreate in the northern Gulf of Mexico region, and therefore, rely on the natural and physical resources the Gulf's environment provides. In addition to the ecological significance of its natural resources, as well as its range of habitats, the northern Gulf of Mexico ecosystem is also culturally and socioeconomically important to the people of the region and the nation. Coastal areas in the affected states[1] contain dozens of culturally important State and National Parks. In addition, the economy of the northern Gulf of Mexico is highly intertwined with its natural resources,

[1] Texas, Louisiana, Mississippi, Alabama, and Florida

which include: oil and gas deposits; commercial and recreational fisheries; waterfowl, migratory birds, and other wetland-dependent wildlife; and coastal beaches and waterways for ports, waterborne commerce, and tourism. In 2009, the total economy of the northern Gulf of Mexico region supported over 22 million jobs (17.2% of all jobs in the US), and produced over $2 trillion in GDP (16.7% of all GDP produced in the U.S.) (NOAA 2012).

Socioeconomic resources and topics described in the Affected Environment section of the Final Phase III ERP/PEIS are: Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure; Land and Marine Management (including National and State Parks, Refuges and Wildlife Management Areas, Land Trusts, and Marine Protected Areas); Tourism and Recreational Use (including Wildlife Observation, Hunting, Beach and Waterfront Recreation, Boating, Recreational Fishing, Tourism, and Museums, Cultural Resources, and Education Centers); Fisheries (including Commercial Fishing, Shellfish Fishery, and Seafood Processing and Sales); Aquaculture (including Stock Enhancement); Marine Transportation; Public Health and Safety; and Flood and Shoreline Protection.

2.5 Updates to the Affected Environment and Environmental Setting Description

Updates to the description of the affected environment necessary to analyze the potential impacts from the projects proposed in this Final Phase IV ERP/EA are described below.

2.5.1 Sea Turtles

Section 3.3.2.6 (and other sections) in the Final Phase III ERP/PEIS notes that critical habitat had been proposed for the Loggerhead sea turtle Northwest Atlantic Distinct Population Segment (DPS). Critical habitat was designated for the loggerhead on July 10, 2014 for both the marine and terrestrial environments (79 FR 39756 (July 10, 2014); 79 FR 51264 (Aug 28, 2014)). Additionally, on March 23, 2015, the green sea turtle ESA listing was proposed for revision to include 12 DPSs, 3 endangered and 8 threatened (80 FR 15271).

Appendix A.5 Sea Turtles in the Final Phase III ERP/PEIS describes the primary constituent elements (PCEs) for critical habitat as defined in the proposed designation. Upon final designation of loggerhead critical habitat, a fourth PCE for nesting habitats was added by the USFWS. The fourth PCE includes: "Natural coastal processes or artificially created or maintained habitat mimicking natural conditions."

The USFWS added the fourth PCE in the final designation in response to concerns and confusion in the proposed rule regarding beach stabilization projects:

"This [PCE] includes artificial habitat types that mimic the natural conditions described in PCE 1 to 3 … for beach access, nest site selection, nest construction, egg deposition and incubation, and hatchling emergence and movement to the sea. Habitat modification and loss occurs with beach stabilization activities that prevent the natural transfer and erosion and accretion of sediments along the ocean shoreline. Beach stabilization efforts that may impact loggerhead nesting include beach nourishment, beach maintenance, sediment dredging and disposal, inlet channelization, and construction of jetties and other hard structures. However, when sand placement activities result in beach habitat that mimics the natural beach habitat conditions, impacts to sea turtle nesting habitat are minimized." (79 FR 39774)

In the previous analysis conducted in Chapter 6 in the Final Phase III ERP/PEIS, the potential impacts from the programmatic alternatives to the proposed critical habitat and proposed PCEs for sea turtles were evaluated as if the designation was final, to ensure a conservative analysis. The Trustees also did not distinguish between natural or artificial habitats (that mimic the natural conditions) because sea turtles are known to use both types of areas for nesting. Therefore, the Trustees have determined that the original analysis in Chapter 6 in the Final Phase III ERP/PEIS is still valid and no supplemental or new analysis is necessary to address the change in status from proposed to designated critical habitat.

2.5.2 Birds

Section 3.3.2.8 Birds (and other sections) in the Final Phase III ERP/PEIS describes the Red Knot as a species proposed for listing under the Endangered Species Act (ESA). This species was listed as threatened on December 11, 2014 (79 FR 73706). In previous analysis conducted under Chapter 6 in the Final Phase III ERP/PEIS, the Trustees evaluated potential impacts from the different alternatives to the Red Knot as if it were already listed to ensure a conservative analysis. Therefore, the Trustees have determined that the original analysis in Chapter 6 in the Final Phase III ERP/PEIS is still valid and no supplemental or new analysis is necessary to address the change in status from a proposed to a listed species.

2.5.3 Fisheries

The U.S. Atlantic pelagic longline (PLL) fishery has historically been comprised of distinct segments throughout the Atlantic, Gulf of Mexico, and U.S. Caribbean (including the high seas). These segments are described in more detail in the 2011 Atlantic Highly Migratory Species (HMS) Stock Assessment and Fishery Evaluation (SAFE) Report (NMFS 2011). Some vessels fish in more than one fishery segment during the course of a year (NMFS 1999). Each vessel has different range capabilities due to fuel capacity, hold capacity, size, and construction. Thus, PLL vessels home ported in the Gulf of Mexico may also fish outside the Gulf of Mexico and vessels home ported outside the Gulf of Mexico may fish in the Gulf of Mexico. Due to the various changes in the fishery (e.g., regulations, operating costs, market conditions, species availability, etc.), the fishing practices and strategies of these different segments may change over time.

2.6 References

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Chapter 3: The *Deepwater Horizon* Oil Spill Natural Resource Injury Assessment

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3.1 Introduction

The Trustees described the status of natural resource damage assessment activities pertaining to the Spill as part of the Final Phase III ERP/PEIS (see Chapter 4), released to the public in June 2014. Below, the Trustees update that description based on the status of natural resource damage assessment activities.

The Trustees are in the process of assessing injuries caused by the Spill to natural resources and the services provided by these resources. The assessment extends from the deep ocean to the highly productive coastal habitats and estuaries along the five Gulf States, and includes a broad array of fish and shellfish species, rare deep sea corals, plankton and invertebrates that serve as prey for larger organisms, coastal vegetation, birds, sea turtles, and marine mammals. Additionally, impacts to recreational use of these resources and habitats, such as recreational fishing, boating, and other shoreline activities are also being assessed.

The Trustees have developed and implemented hundreds of scientific assessment studies focused in areas ranging from deep sea sediments, through the water column, to the nearshore and shoreline. In so doing, the Trustees have worked with technical teams including scientists from state and federal agencies, academic institutions, and BP. This cooperative approach to injury assessment is strongly encouraged by the OPA NRDA regulations, with the goal of creating a common set of data for quantifying injury.

The Trustees have established websites to provide the public with access to work plans and data related to the injury assessment.[1] In addition, in April 2012 the Trustees published an NRDA status update to provide the public with an overview of the potential impacts to resources in the Gulf of Mexico ecosystem caused by the spill; it also outlined the activities undertaken by Trustees to assess the injury.[2]

Many aspects of the injury assessment phase are ongoing. Information presented in this chapter remains subject to revision based on additional data or analysis.

[1] As NRDA work plans and data are made public, they are posted to www.doi.gov/deepwaterhorizon/adminrecord/ www.gulfspillrestoration.noaa.gov, www.fws.gov/home/dhoilspill, and http://la-dwh.com. Data that are made public also are available on www.geoplatform.gov/gulfresponse/

[2] Natural Resource Damage Assessment April 2012 Status Update for the Deepwater Horizon Oil Spill, http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/FINAL_NRDA_StatusUpdate_April2012.pdf

3.2 The Injury Assessment Process: Assessing Injuries in a Complex, Interconnected Ecosystem

Oil from the Spill spread, through a variety of different pathways, over a large area of the Gulf of Mexico environment. Oil and gas released from the wellhead was transported at depth or rose from the wellhead to the surface of the water and was volatized to the atmosphere or moved with surface waters (Camilli et al. 2010). Some of the oil and gas dissolved into the water, some oil was dispersed into tiny oil droplets, and some adsorbed onto particles in the water. Surface oil was transported by natural processes such as wind and waves, eventually reaching Gulf shorelines (Benton et al. 2011). An array of habitats and associated biological communities and organisms were exposed to the oil and/or gas, including, deep water soft bottom sediments, deep water coral reefs, and mesophotic coral reefs; water column; and nearshore and shoreline habitats such as submerged aquatic vegetation (SAV), intertidal and subtidal reefs, marshes, and beaches (OSAT 2010 and White et al. 2012). Oil and dispersant vapors also were present in the atmosphere in some areas (Middlebrook et al. 2012 and OSHA 2014).

The Gulf of Mexico ecosystem includes a complex and interconnected web of organisms (individual species, populations, and communities), habitats, and natural processes and functions. Consequently, natural resources may be adversely affected by oil by direct exposure or indirectly – for example, through loss of spawning and nesting habitat or reductions in prey availability caused by lost primary and secondary productivity. When natural resources are injured, cascading indirect ecological effects can also occur, including changes in ecological structure (such as increasing rates of shoreline erosion) and ecological functions (such as reducing habitat suitability for foraging).

In designing the injury assessment, the Trustees have undertaken studies to evaluate potential Spill-related impacts on species and habitats of particular legal, management and/or ecological concern. However, because of the diversity and complexity of the Gulf of Mexico ecosystem, the vast area of the northern Gulf of Mexico that was affected by the Spill, and the practical challenges of performing scientific studies in some habitats such as the deep ocean, it is impossible to study every species, habitat, location, and ecological process that was potentially affected. Therefore, the Trustees have focused the injury assessment on representative species, habitats, and locations. In this way, the Trustees can then use the results of individual studies to make reasonable scientific inferences about natural resources that were not explicitly studied, based on an understanding of ecological relationships and processes.

Oil and/or dispersants can adversely impact natural resources and natural resource services through a variety of pathways and modes of action (for example smothering or chemical toxicity). Several examples are provided in the following sections of this chapter. In addition, while efforts to protect biota and habitats from oiling and/or to remove oil from the environment are necessary and critical, such cleanup or response actions can themselves cause natural resource injuries. For example, adverse impacts to habitats and/or biota can be caused by:

- Installation, maintenance, and removal of a wide range of types of physical barriers constructed to prevent oil from entering shoreline habitats;

- Manual and mechanical activities required to remove oil from shoreline, nearshore, and substrate habitats (including staging areas and access areas); and/or
- The release of freshwater from diversion structures to keep oil from moving into nearshore habitats.

In their assessment of natural resource injuries from oil and/or dispersants and other response related injuries, the Trustees are applying a combination of field, laboratory, and numerical modeling approaches. Field studies have been performed to document environmental conditions, evaluate exposure, and assess the condition of biological resources. In some circumstances, field-based enumeration of affected biota (e.g., oiled birds) can be undertaken and used to inform estimation of the magnitude and severity of certain types of spill impacts. However, because of the enormous spatial scale affected by the Spill, detecting changes in some natural resources by observing or counting organisms in the field can be difficult and/or impractical. The Trustees are increasing the interpretive power of their assessment by combining field studies with controlled laboratory studies designed to study the effects of oil on Gulf of Mexico biota. As appropriate, field and laboratory data are combined in mathematical computer models to enable interpretation and quantification of injuries at the broad spatial and ecological scale necessary for the NRDA.

3.3 Injuries to Natural Resources

The following subsections of this chapter provide an update for several areas of the Trustees' natural resource damage assessment, including:

- Laboratory toxicity testing
- Deep benthic environments
- Water column fish and invertebrates
- Marine mammals
- Sea turtles
- Birds
- Oysters
- Marsh and mangrove habitat
- Beach habitat
- Un-vegetated nearshore sediment
- Submerged aquatic vegetation
- Recreational use

The information provided in this chapter is not intended to provide a comprehensive review of the status of all assessment activities. Rather, it provides an appropriate level of background and context for the task of considering the proposed Phase IV Early Restoration projects that are the subject of the remaining chapters in this document.

3.3.1 Laboratory Toxicity Testing Program

The Trustees have undertaken a comprehensive laboratory toxicity testing program to evaluate the adverse effects of oil and dispersant on marine organisms of the Gulf of Mexico. The testing program is designed to determine the nature of toxic effects that occurred to different organisms in different habitats, the concentrations of oil and dispersant at which such effects occur, and how exposure to oil in a range of weathering states can adversely affect the viability of organisms in various stages of their life histories. Laboratory toxicity test results are being published as they are completed. Some examples include: Brette et al. 2014, Incardona et al. 2014, and Mager et al. 2014. Additionally, Trustees are mindful that the scientific community has undertaken extensive testing and research regarding the Spill. Trustees continue to stay abreast of current research, which may impact the understanding of ecological injury in the northern Gulf of Mexico.

The Trustees' aquatic toxicity tests involve exposing test organisms to samples of the released oil in various states of weathering (fresh to very weathered), with and without the presence of dispersant. This process was applied to samples of contaminated sediment as well. A wide variety of representative marine and estuarine species, including fish, shellfish, and invertebrates, are being tested as part of the program. Scientists typically conduct these laboratory toxicity tests by exposing test organisms to a range of oil concentrations under controlled conditions. By conducting the tests in this way, scientists are able to calculate the adverse effects that would be expected to occur at various oil concentrations in specific exposure conditions.

The Trustees' aquatic toxicity testing program includes studies both of the lethal effects of oil and dispersant to determine the concentrations of oil that kill organisms, and the "sub-lethal" impacts of oil to determine concentrations of oil that can cause significant adverse effects on the health, growth, reproduction, or general viability of organisms. For example, some of the sub-lethal effects of oil that have been documented in the Trustees' aquatic toxicity tests to date include:

- Disruptions in growth, development, and reproduction;
- Tissue damage;
- Altered cardiac development and function;
- Disruptions to the immune system;
- Biochemical and cellular alterations; and
- Changes in swimming ability and other behaviors that can adversely affect an organism's viability in the environment.

Overall, the results of the Trustees' aquatic toxicity testing program will provide a means for the Trustees to reach conclusions regarding the nature and extent of different types of adverse impacts to aquatic organisms based on observed, measured, and modeled concentrations of oil and/or dispersant on the surface of the water, in the water column, and in bottom sediments.

Similar to the efforts to assess the adverse effects of oil on marine and estuarine organisms, the Trustees are assessing the adverse effects of oil on avian species that inhabit the Gulf of Mexico. Millions of birds utilize the northern Gulf including, but not limited to, sea birds, colonial nesting birds,

shorebirds, waterfowl and passerines. The Trustees are conducting laboratory toxicity tests to determine the types and extent of adverse effects of oil from the Spill on avian species.

3.3.2 Deep Benthic Environments

Deep sea habitats include important reservoirs of biodiversity and also serve vital roles in the recycling of carbon and other building blocks for life in the sea, enabling productivity from the near bottom to surface waters of the ocean (Buhl-Mortensen et al. 2010, Gjerde 2006, Llodra and Billett 2006, Rex and Etter 2010, Ruppert and Barnes 1993, Grassle and Maciolek 1992 and Gage 1996). New species and ecological relationships are regularly discovered with our increased exploration of these remote regions of the sea. This zone is characterized by limited light penetration and is populated by organisms adapted to cold, high-pressure, and dark conditions (Fisher et al. 2007, MacDonald and Fisher 1996). Much of the energy reaching the sea floor is provided in the form of "marine snow," which is a mixture of sediment and biological detritus that, in general, falls from the upper photic zone, through the water column, to the bottom (Alldredge and Silver 1998). The deep environments under investigation pursuant to the NRDA fall into several major habitat types. These include soft bottom sediments, which make up the majority of the ocean floor in the northern Gulf of Mexico; hard bottom rocky patches that can support deep sea coral communities in depths of greater than 650 feet (200 m); and mesophotic coral reefs found at depths of about 160 – 650 feet (50 – 200 m), the deepest zone where light can penetrate.

Studying the deep ocean environment is challenging, and relatively little is known about the ecology of the organisms using these habitats. The Trustees have been working to quantify the nature and magnitude of injuries to these unique and sensitive deep water habitats using remotely operated vehicles, autonomous underwater vehicles, and complex water and sediment sampling devices. Data and analyses available to date have documented injuries to these habitats attributable to the Spill, including but not limited to a large footprint of injury around the wellhead and extending to the southwest, as well as losses at mesophotic coral reefs located to the north and northeast of the wellhead. The footprint of injury around the wellhead includes areas of soft bottom sediment in which diversity of sediment-dwelling animals has been reduced (Montagna et al. 2013) and deep sea coral habitats which have been degraded (White et al. 2012, Hsing et al. 2013, and Fisher et al. 2014). Injuries to mesophotic coral reef habitats include reduced numbers of planktivorous fish species and increased prevalence of injured corals in the affected area compared to reference reefs that were outside the influence of the Spill.

3.3.3 Water Column Fish and Invertebrates

The water column of the Gulf of Mexico supports a wide variety of organisms, including numerous species of fish at different life stages (from fertilized eggs, to larvae, juveniles, and adults), as well as many species of phytoplankton, zooplankton, and bacteria (Mann and Lazier 2006 and Lyczkowski-Schultz et al. 2004). All of these organisms play an important ecological role, including serving as prey for fish, invertebrates, birds, sea turtles, and marine mammals as well as cycling and transporting nutrients between nearshore and offshore areas and between the surface and the deep sea (Felder and Camp 2009). Many fish and invertebrate species support robust commercial and recreational fisheries.

To help understand the fate, chemical weathering, transport, and toxicity of the oil, the Trustees have collected data to document physical and chemical water conditions in and around the spill area. These data include currents and physical properties of the water column in the vicinity of the wellhead; dissolved oxygen data to help assess the effect of microbial degradation of the oil and to track the fate of the oil; and data on suspended sediments, chlorophyll concentrations, and other physical measurements. Trustees are accounting for temporally variable surface water oiling in calculations of exposure and injury. Concentrations of oil components are calculated for multiple depth intervals. To help evaluate impacts to water column organisms, the Trustees have gathered and analyzed information on the density and abundance of organisms that live in the water column, including variations in their distribution over space and time. Animals exposed in the water column include small and large pelagic fish, demersal fish that live near the bottom of the ocean, invertebrates, and planktonic organisms in both the nearshore and offshore environment. Preliminary Trustee analysis suggests that tens of thousands of square miles of surface waters were affected by oiling and that hundreds of cubic miles of surface water may have contained petroleum compounds at concentrations associated with mortality to sensitive aquatic organisms. This indicates that injuries to water column organisms were widespread, both spatially and in terms of the diversity of organisms and life stages that were affected.

3.3.4 Marine Mammals

Marine mammals that reside in the Gulf of Mexico include 21 species of cetacean (whales and dolphins) and one sirenian (manatee) (Waring et al. 2010). All are protected under the Marine Mammal Protection Act, 16 U.S.C. §§ 1361 *et seq.* (MMPA). Sperm whales (*Physeter macrocephalus*), the West Indian manatee (*Trichechus manatus*) North Atlantic right whales (*Eubalaena glacialis*), fin whales (*Balaenoptera physalus*), and humpback whales (*Megaptera novaeingliae*), are listed as endangered under the Endangered Species Act (ESA). Based on life histories and habitat preferences of these species, and on observations of oil within marine mammal habitats, the Trustees divided marine mammals into three functional groups for the purposes of injury assessment: oceanic marine mammals (targeting primarily sperm whale, Bryde's whale, striped dolphin and Risso's dolphin), coastal dolphins, and estuarine bottlenose dolphins.

Available information suggests that thousands of marine mammals were exposed to oil from the Spill. Recently published NRDA studies (Schwacke et al. 2014) indicate the presence of adverse health outcomes resulting from this exposure. For example, data from 2011 health studies indicate that bottlenose dolphins in Barataria Bay (which suffered heavy and prolonged exposure to oil) demonstrated signs of severe ill health, with many dolphins sampled in Barataria Bay given a "guarded," "poor" or "grave" prognosis. Symptoms included low body weight, anemia, impaired stress response, and lung disease (Schwacke et al. 2014). These impacts are consistent with expected effects of exposure to oil or petroleum-related chemicals reported in the literature. Data analysis for the marine mammal assessment in the Mississippi Sound and in other areas of the Gulf of Mexico has been underway, as has been collection and evaluation of data relevant to the assessment of the type and magnitude of injury to marine mammals attributable to the Spill.

In addition to live animal studies, the Trustees are analyzing data collected from the high number of dead stranded marine mammals (>1,300, primarily bottlenose dolphins) since 2010. These strandings have resulted in the declaration of an Unusual Mortality Event (UME) under the Marine Mammal Protection Act. This UME is larger and has lasted longer than any other dolphin mortality event in the Gulf on record (Litz et al 2014). A recent publication identifies four distinct spatial and temporal patterns within the ongoing UME, three of which occur during and after the spill and in areas exposed to the oil (Venn-Watson et al 2015). A UME was also declared in Texas between November 2011 and March 2012. The body conditions of some of the dolphins from the Texas UME were similar to some of the animals that are included in the larger Gulf UME.

The Trustees also investigated non-oil factors that may have contributed to the observed health effects or have been causes of previous UMEs, such as disease (morbillivirus), biotoxins from harmful algal blooms and other contaminants. Researchers have determined that these factors are unlikely to be associated with the current UME.

Dolphins are long-lived species that are slow to mature and reproduce, and it could be many years before the full effects of the *Deepwater Horizon* spill on dolphin populations are realized.

3.3.5 Sea Turtles

There are five species of sea turtles living in the Gulf of Mexico and all are listed as threatened or endangered under the ESA: Kemp's ridley (*Lepidochelys kempii*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*) and hawksbill (*Eretmochelys imbricata*). Sea turtles can nest on any beach with suitable conditions throughout the Gulf, from Mexico to Florida. All five species of sea turtles are migratory and thus have a wide geographic range. Sea turtles were exposed to oil in open water, in *Sargassum* habitat, or on nesting beaches, either through ingestion of oil, direct contact with oil, and/or inhalation of volatile oil and dispersant-related compounds. In addition, response activities, such as collecting and burning oil at sea, skimmer operations, boom deployment, berm construction, increased lighting at night near nesting beaches, beach cleanup operations and boat traffic may have injured sea turtles directly or by blocking access to turtle nesting beaches and changing their reproductive behavior.

The Trustees are using a variety of information to evaluate injuries to sea turtles, including stranding records; response recovery operation records; aerial surveys from aircraft; analysis of open ocean areas, including *Sargassum* habitat, where oceanic juvenile turtles are found; baseline turtle densities; veterinary examination of oiled turtles; necropsies of dead turtles, including tissue analyses; studies on the toxicological effects of oil; and analysis of nesting and hatching success. Preliminary findings include:

- More than 500 oceanic juvenile turtles were recovered during attempts to rescue sea turtles from oil and oiled *Sargassum* in the summer of 2010. Most were visibly oiled. Oil was often found within the mouth, pharynx, and esophagus in oral exams of live turtles and necropsies of dead turtles that were visibly, externally oiled upon recovery;

- More than 2,000 sea turtles (of all life stages) were found stranded dead in the northern Gulf of Mexico from 2010 to 2013. Causes of these strandings are being investigated.
- Broad-scale aerial surveys conducted in 2010 are yielding density, abundance, and exposure estimates of juvenile and adult turtles in neritic waters (less than 100 m depth) that were sighted within the footprint of surface oiling; and
- Nearly 15,000 hatchling sea turtles emerged from nests translocated from Gulf of Mexico beaches in Florida and Alabama and were released on the Atlantic coast of Florida to prevent exposure to oil. Sea turtles typically return to their natal beaches (the beach where they were hatched) to nest. The effects of the translocation to the Atlantic may have disrupted this natal homing behavior.

Sea turtles live for many decades and the full extent of impacts to the five affected species of sea turtles may not be apparent for many years.

3.3.6 Birds

The northern Gulf of Mexico is important to a variety of birds that depend on its diverse and productive habitats. Approximately 500 species use the northern Gulf at some point in their life cycle. The varied habitats include beaches, mudflats, dunes, bars, bay and barrier islands, emergent (marsh) and forested (mangrove) wetlands, and shallow bay and marine open water. Species of conservation concern and that have regional importance using these habitats for breeding include American oystercatcher, snowy plover, Wilson's plover, gull-billed tern, black skimmer, reddish egret, black rail, and brown pelican. Colonial waterbird rookery islands along the Gulf provide some of the most diverse and concentrated bird nesting sites in the nation. The northern Gulf also supports nearly half of the southeastern population of brown pelican. The northern Gulf of Mexico is critically important for migration and overwintering habitat for a variety of migratory birds. In addition, Gulf Coast marshes are important to many marsh birds, including but not limited to seaside sparrows, black rail, clapper rail, king rail, Virginia rail, sora, least bittern, and American bittern. The Gulf Coast also supports protected bird species, such as the piping plover and red knot, which are federally listed under the ESA. At least 70 percent of all piping plovers winter on the shores of the Gulf of Mexico.

Seabirds, colonial waterbirds, coastal marsh birds, and shorebirds are particularly susceptible to impacts from the oil. Oiled birds can lose the ability to fly, dive for food, or float on the water, which can lead to drowning. Oil and dispersants interfere with the water repellency of feathers and can lead to problems of thermoregulation (e.g., hyper- or hypothermia). In addition, birds may ingest or inhale oil while cleaning (preening) their feathers, by consuming contaminated vegetation or prey, or by incidental ingestion of contaminated sediment. This exposure can kill the bird, leave it susceptible to predation or lead to long-term physiological, metabolic, developmental, and/or behavioral effects, which can in turn lead to reduced survival and/or reproduction. Exposure to oil also can reduce the hatching of eggs and survival of hatchlings. Examples of direct and indirect avian injury can include, but are not limited to, mortality, productivity loss, decline in reproductive success, sub-lethal effects, and reduced body fitness due to loss of prey resources and habitat for nest building.

The Spill injured avian resources throughout the northern Gulf through a variety of mechanisms, including but not limited to exposure to oil, disturbance from response activities, cleaning in rehabilitation facilities, and degradation of habitat. Approximately 8,500 live impaired and dead birds were collected in the northern Gulf of Mexico as part of wildlife rescue and NRDA operations during and following the Spill. These birds represent over 100 species collected in all five Gulf Coast states. Due to the inability to search all areas and recover all affected birds, collected birds represent a fraction of the total number of birds that were killed or impaired as a result of the Spill. Additionally thousands of photographs were taken of birds that showed external exposure of oil on feathers. This exposure could have potential short-term and long-term effects on individual and offspring survivorship.

The Trustees are conducting a broad spectrum of studies to fully evaluate the impact of the Spill on avian species, including incident-specific avian toxicity studies and evaluations of potential impacts experienced by oiled birds collected from the northern Gulf. This approach allows for controlled laboratory testing of the oil to specifically identify adverse effects and for confirmation that these effects are observed in oiled, wild birds.

3.3.7 Oysters

The eastern oyster (*Crassostrea virginica*) forms an integral component of nearshore coastal ecosystems and local economies along the Gulf of Mexico (Eastern Oyster Biological Review Team 2007). Oysters provide numerous ecological services to estuarine systems, including production of biomass, filtering water to remove organic and inorganic particles, and improving water quality and clarity. Oyster reefs provide habitat for numerous other shellfish, crabs, and finfish. Oysters are also a valuable commercial and recreational fishery resource (Eastern Oyster Biological Review Team 2007). Oysters in the Gulf of Mexico are present in both intertidal and sub-tidal areas (Eastern Oyster Biological Review Team 2007). Commercial oysters are harvested from sub-tidal areas, but intertidal oysters may be important as a source of larvae to maintain populations of both intertidal and sub-tidal oysters.

In response to the Spill, large volumes of freshwater from Mississippi River diversion structures in Louisiana were released as part of a set of response actions designed to reduce the movement of oil into sensitive marsh and shoreline areas. The volume and duration of the low salinity water from these response actions adversely affected oysters. Analyses of 2010 data suggest oysters in areas affected by lowest salinity water experienced substantial mortality in Louisiana. Oyster abundance and biomass in 2010 was low in many areas.

Oyster gametes and larvae float to the surface after spawning and remain at the surface for the early part of their planktonic period. They can travel up to 40 miles in surface waters. Oyster eggs, sperm, and larvae were exposed to oil and potentially dispersants through direct contact with water. PAHs are toxic to oyster gametes, embryos, larvae, juveniles and adults and result in lethal and sub-lethal effects (e.g., impaired reproductive success). Intertidal adult oysters were also likely exposed to oil droplets and oil on suspended sediment and detritus.

Fall 2010 sample results suggest oyster larvae were rare or absent in many of the samples collected across the northern Gulf of Mexico. Oyster spat recruitment was extremely low or zero in 2010 over

large areas of subtidal oyster habitat along the northern Gulf coast. There was also low spat recruitment through the spring and fall of 2011 and the fall of 2012.

3.3.8 Marsh and Mangrove Habitat

The high productivity of coastal marsh vegetation provides an ideal nursery ground that supports a wide variety of finfish, shrimp, and shellfish (Mitsch and Gosselink 2007, Daily et al. 1997, and Minello and Webb 1997). Many bird species are dependent on marshes for foraging, roosting and nesting, and marshes are also critical to both migratory and wintering waterfowl (Mitsch and Gosselink 2007). The marsh edge also serves as a critical transition between the emergent marsh and open water. This area serves as the gateway for the movement of organisms and nutrients between intertidal and subtidal estuarine environments. Additionally, marsh edge has been found to be the most productive area of the marsh for many organisms (English et al. 2009).

The highly productive black mangrove (*Avicennia germinans)* occurs in association with smooth cordgrass (*Spartina alterniflora*) in many locations of the northern Gulf of Mexico and is important for maintaining shoreline protection and stabilization (Carlton 1974 and Massel et al. 1999). It is an essential feeding and nursery habitat for juvenile fish such as snapper (Coleman et al. 2000 and Mumby et al. 2004). The roots of mangroves that emerge from the water and soil provide excellent habitat for small organisms. Some species of colonial waterbirds, such as herons, egrets, and pelicans, build nests in mangroves and forage in the mangroves or nearby (Davis et al. 2005).

Declines in marsh vegetative health have been observed in oiled marshes relative to reference marshes. Key measurements illustrating adverse effects of oil on marsh vegetation included reductions in live plant cover, total vegetation cover, and above ground biomass. These effects generally are more pronounced along the highly productive marsh edge. Moreover, shorelines with more significant oiling tended to experience greater adverse effects.

In addition to vegetation impacts, impacts on animals that live in the marsh have been demonstrated. For example, researchers have documented a lower abundance of *Littoraria* snails (a typically abundant marsh organism that is an important source of prey in intertidal habitats) in heavily oiled areas relative to un-oiled areas more than a year after the Spill began.

3.3.9 Beach Habitat

Beaches are vital both ecologically and economically (Schlacher et al. 2008 and United Nations Millennium Assessment 2005). Ecologically, beaches provide habitats for numerous migratory birds, invertebrates, and terrestrial wildlife. Organic material such as sea grass that is cast up onto the beach by the surf, tides, and wind provides foraging opportunities and shelter for breeding and wintering shorebirds (Dugan et al. 2003). Colonial nesting gulls, terns, and skimmers nest on open beaches. The sand beaches of the northern Gulf Coast, including various state and federal parks, are also important recreational destinations and tourist attractions that support local and regional economies (e.g., Parsons et al. 2009, Mobile Area Chamber of Commerce 2010, Gulf Coast Business Council Research Foundation 2012, and Houston 2013).

Preliminary estimates indicate that about 600 linear miles of sand beach habitat were oiled as a result of the Spill. At the peak of the Spill, beaches were oiled from Texas to the Florida Panhandle. Many of these beaches were oiled repeatedly over an extended time period. A significant effort to remove oil from beaches was launched across the northern Gulf of Mexico. Oiling of beaches can have a variety of effects on the physical and biological communities of the beach and near shore habitats. Shoreline protection and clean up related to the Spill affected biological communities as well. At least 400 miles of oiled beaches also experienced some level of impairment due to response activities.

3.3.10 Unvegetated Nearshore Sediment

The unvegetated nearshore benthic sediments and tidal flats of the Gulf of Mexico serve as an important and diverse habitat for many species. Crabs, shrimp, fish, shorebirds, waterfowl and terrestrial wildlife feed on the rich populations of organisms living on and in the nearshore sediments (e.g., McTigue and Zimmerman 1998, Perry and McIlwain 1986, Fox et al. 2002, and Gabbard et al. 2001). This sediment-based system notably includes the major shrimp species in the Gulf of Mexico, including white and brown shrimp (Muncy 1984, Bielsa et al. 1983, Lassuy 1983, also see www.fishwatch.gov). Three key commercial species of crabs in the Gulf of Mexico region also are supported by sediment-based ecosystems: blue crab, Gulf stone crab, and stone crab (Lindberg and Marshall 1984, Perry and McIlwain 1986, also see www.fishwatch.gov). Gulf sturgeon (threatened under ESA) also forage on the bottom of the bays and estuaries of Florida, Alabama, Mississippi, and Louisiana, eating invertebrates such as mollusks, worms and crustaceans (Fox et al. 2002, USFWS and NMFS 2009).

As part of the evaluation of the magnitude and extent of oil that stranded and persisted in the shoreline and nearshore environment, nearshore sediment was sampled within one kilometer of the shoreline in 2010 and 2011. These sediment samples have been analyzed for polycyclic aromatic hydrocarbons (PAHs) and other parameters to evaluate the potential for injury to nearshore species. Analysis of over 2,500 sediment samples has revealed the presence of PAHs in many nearshore sediments, with highest concentrations occurring adjacent to heavily oiled vegetated shorelines. Field and laboratory toxicity studies are being conducted to evaluate the implications of this contamination for nearshore fish and invertebrates.

Overall, the Trustees' assessment of injury to nearshore sediment habitat indicates that shallow water sediments were contaminated with oil following the Spill and that the degree of contamination was sufficient to cause a range of adverse effects on survival, reproduction, health of organisms and overall ecosystem productivity within this important habitat.

3.3.11 Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV) refers collectively to a group of rooted plants that grows up to the water surface. Various seagrasses grow in marine water, and other species live in fresh and brackish habitats of the Gulf of Mexico. SAV is a highly productive habitat in the northern Gulf of Mexico which provides food and shelter for fish, shellfish, crustaceans, and other invertebrates (Gulf of Mexico Program 2004). It also is an important foraging habitat for sea turtles and resident and migrating birds (USFWS 2012 and Gulf of Mexico Program 2004). It serves as nursery habitat for many species, produces

oxygen in the water column as part of the photosynthetic process and enhances water quality by filtering water and removing excess nutrients. SAV also stabilizes sediment and is vital to keeping barrier islands intact (Fonseca et al. 1998 and Porrier 2007).

Sampling was performed to evaluate oil exposure at a number of sites in the northern Gulf of Mexico. Oil was detected in samples at several SAV sites, and preliminary information suggests that at least 10 square miles of SAV beds were oiled and/or adversely affected by a variety of response activities.

3.3.12 Recreational Use

The Gulf of Mexico provides a wide range of recreational opportunities to local residents and visitors from across the nation. These include recreational fishing, boating, visiting beaches, and other activities. The Spill resulted in closures of beaches, fishing areas, publicly owned and managed areas, and waterways, preventing access to these areas by both local and more distant recreational users. In addition to these direct closures, the Spill also caused some recreational users to change the type of recreational activities they would otherwise engage in. Other users cancelled their planned recreational visits or traveled to alternate locations because of the threat of oiling (or because of actual oiling that did not result in beach closures), or visited oiled beaches and therefore suffered from degraded, lower quality trips. Other coastal recreational activities would likely have been disrupted as a result of the Spill.

For each broad type of injury (shoreline use, boating/boat based fishing trips, and shore-based fishing), Trustee experts developed a sampling and analysis plan to estimate the change in recreational use in the assessment area resulting from the Spill. Each of these approaches is described in more detail below. These assessment activities provide estimates of recreational use including counts of recreational users over time and information on the type of activities in which users engaged. By comparing recreational use during the spill period with the counts during a baseline period, and adjusting for other non-spill related differences between the two periods, the Trustees can estimate the number of lost recreation user days in the assessment area. In addition, the Trustees are evaluating recreational use data from a variety of sources and surveys for determining potential impacts in other coastal areas where the data described above are unavailable.

One major category of injury is shoreline use, which includes any recreational visitation to beach sites in the assessment area, such as sunbathing, swimming, birding or other wildlife viewing, walking, and running. Aerial over-flights and on-the-ground fieldwork on beaches that began in the weeks following the Spill provide a measure of recreational use along the Gulf Coast shoreline.

Another major category of injury is boating and boat-based fishing trips, which includes any recreational users who would have engaged in recreational fishing or pleasure boating in the assessment area during and after the Spill period. This assessment does not include those fishing for commercial purposes since losses to commercial enterprises are not part of an NRDA claim. Assessment teams started counting departures at public boat ramps in the assessment area shortly after the Spill at publicly accessible sites. As boating and boat-based fishing also occurs from non-public locations, such as backyards, private marinas, and other sites, Trustees also conducted surveys to assess impacts upon this recreational user

group. Together, these data collection efforts provide measures of the level and types of boating and boat-based fishing along the coastal waters of the Gulf of Mexico.

Another major category of injury that required a significant assessment effort is shore-based fishing, which includes fishing from beach locations as well as fishing from piers and jetties or other similar structures. Assessment teams conducted field counts of users engaged in this activity type beginning shortly after the Spill.

Preliminary Trustee review of recreational use data indicates that over ten million recreational user days were lost or otherwise adversely affected by the Spill.

3.4 Use of Assessment Data to Inform Early Restoration Project Selection

Throughout the Early Restoration process, the Trustees have used preliminary results from the assessment to inform and guide the selection of Early Restoration projects. As noted above, the assessment work to date has clearly demonstrated areas of extensive oiling of coastal and nearshore habitats from Texas to the Florida Panhandle. Preliminary results also make clear that the oiling has had significant adverse impacts on coastal and nearshore habitats, including species using the open Gulf of Mexico. In addition, initial results from the Trustees' assessment clearly show that oiling caused very large reductions in coastal recreation from Texas to Florida. Analysis of recreational data assembled by the Trustees indicates that more than 10 million user-days of beach, fishing and boating activity were lost due to the spill.

Early Restoration reflects the Trustees' programmatic approach to focus on injury categories for which the nature of the adverse impacts is reasonably well understood. A future damage assessment and restoration plan will be developed to address all assessed injuries and losses, taking into account Offsets provided by the Early Restoration program.

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4.1 Overview of Phase IV Early Restoration Projects

This chapter provides introductory, overview information about the Phase IV Early Restoration projects that have been selected for implementation by the Trustees. Any additional Early Restoration projects will be proposed and selected in subsequent plans to be released at a future date. As noted throughout this document, Early Restoration actions are not intended to provide the full extent of restoration needed to make the environment and the public whole for the injuries to natural resources caused by the Spill. There will be additional opportunities for consideration of restoration projects in developing future restoration plan(s) as part of the comprehensive NRDA process. Throughout the restoration process, public input and comment will be considered.

The remainder of this chapter provides:

- A summary of Phase IV projects;
- A general description of the methodologies used to estimate Offsets for the projects;
- A general description of the monitoring planned for the projects;
- A general description of the Trustees' approach to environmental compliance; and
- A brief overview of each project.

Detailed information about each project, as well as project-specific information on affected environments and analyses of environmental consequences, is provided in the project-specific Chapters 5-14.

Table 4-1 lists the ten Phase IV projects, identifies the state(s) in which each is located or proximate, identifies the implementing Trustee(s), lists the project cost, and relates each project back to the programmatic Early Restoration project type(s) listed in Chapter 1 and described in the Final Phase III ERP/PEIS.

The Trustees have selected ten Phase IV Early Restoration projects totaling $134 million in estimated project costs. Ecological projects comprise $126.2 million (94%) of this total, and recreational projects comprise the remaining $7.5 million (6%). Overview information concerning all of the projects is presented below.

Table 4-1. Phase IV Early Restoration Projects

PROJECT TITLE	LOCATION	IMPLEMENTING TRUSTEE(S)	COST	PROJECT TYPE[1]
Texas Rookery Islands	TX	TX Trustees, DOI	$20,603,770	Restore and Protect Birds
Restore Living Shorelines and Reefs in Mississippi Estuaries	MS	MS	$30,000,000	Restore Oysters; Protect Shorelines and Reduce Erosion
Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore	MS[2]	DOI	$6,996,751	Enhance Public Access to Natural Resources for Recreational Use; Enhance Recreational Experiences
Bon Secour National Wildlife Refuge Trail Enhancement Project , Alabama	AL[2]	DOI	$545,110	Enhance Public Access to Natural Resources for Recreational Use; Enhance Recreational Experiences; Promote Environmental and Cultural Stewardship, Education and Outreach
Osprey Restoration In Coastal Alabama	AL	AL	$45,000	Restore and Protect Birds
Point aux Pins Living Shoreline	AL	AL	$2,300,000	Protect Shorelines and Reduce Erosion
Shell Belt and Coden Belt Roads Living Shoreline	AL	AL	$8,050,000	Protect Shorelines and Reduce Erosion
Seagrass Recovery Project at Gulf Islands National Seashore, Florida District	FL[2]	DOI	$136,700	Restore and Protect Submerged Aquatic Vegetation
Sea Turtle Early Restoration	Gulf-wide	NOAA, TX Trustees, DOI	$45,000,000	Restore and Protect Sea Turtles
Pelagic Longline Bycatch Reduction Project	Gulf-wide	NOAA	$20,000,000	Restore and Protect Finfish and Shellfish
		Total	**$133,677,331**	

[1] Relevant project type from the Trustees' preferred programmatic alternative (see Chapter 5 of the Final Phase III ERP/PEIS).
[2] These projects will be implemented on federally managed lands and managed by DOI.

4.2 Organization and Content of Phase IV Project Chapters

Chapters 5-14 provide information and analysis related to the Phase IV projects. Each project-specific chapter begins with a general description of the project and relevant background information, followed by: 1) a discussion of the project's consistency with project evaluation criteria; 2) a description of planned performance criteria, monitoring and maintenance; 3) a description of the type and quantity of Offsets BP will receive if the project is selected for implementation; and 4) information about estimated project costs.

Following this project information is a project-specific environmental assessment, which provides information specific to each project's affected environment and analysis of anticipated environmental consequences for the individual projects. The Trustees chose to analyze each project separately under NEPA because each project has independent utility from other Phase IV projects and are not connected

actions.[1] Each of the projects is consistent with project types identified and evaluated in the Trustees' programmatic alternatives (see Final Phase III ERP/EIS). Chapters 5 through 14 describe the environmental consequences, or effects, of implementing Phase IV projects on the physical, biological, and human environment described in Chapter 2. To identify those resources that could be significantly impacted by the proposed alternatives and actions, appropriate definitions of *impacts* must first be identified. Appendix D provides guidelines for resource-specific definitions for determining effects of individual planned actions. These definitions were also included and described in the Final Phase III ERP/PEIS. As part of this effort, these chapters evaluate cumulative impacts of these projects. Sections 4.10 and 4.11 provide detail pertaining to the general approach to identifying cumulative impacts.

4.3 Offsets Estimation Methodologies

The Trustees used three primary methods to estimate Offsets for Early Restoration projects: Habitat Equivalency Analysis ("HEA"), Resource Equivalency Analysis ("REA"), and monetized estimates of project benefits. A general overview of each of these methods is provided below. Table 4-2 provides information about the type(s) of Offsets negotiated with BP for each project. More detailed information about estimated Offsets for each project can be found in Chapters 5-14 and Appendix C of this document.

The methods used to estimate Offsets for Early Restoration projects were implemented pursuant to the Framework Agreement and are based on the expected benefits for each project. In the context of Early Restoration under the Framework Agreement, the Trustees used the best information and methodologies available to judge the adequacy of proposed Early Restoration actions relative to OPA regulatory evaluation standards (see 15 C.F.R. § 990.54(a)), while determining that the agreements reached with BP under the Framework Agreement were also fair, reasonable, and in the public interest. It is important to note that, under the Framework Agreement, neither the amount of the Offsets nor the methods of estimation used in analyzing any project are a precedent for assessing the gains provided by any other projects either during the Early Restoration process, in the assessment of total injury, or in the comprehensive restoration planning process for the Spill.

The Trustees will apply these Early Restoration Offsets against the Trustees' total assessment of BP's NRD liability, consistent with final project stipulations and the Framework Agreement.

[1] NEPA provides that actions that are connected or dependent on other actions must be analyzed together in one NEPA analysis. Actions are considered connected if: (1) they automatically trigger other actions which may require an EIS(s), (2) they cannot or will not proceed unless other actions are taken previously or simultaneously, or (3) they are interdependent parts of a larger action and depend on the larger action for their justification. The Phase IV projects do not fit the description of connected actions in 40 C.F.R. § 1508.25. First, to the best of the Trustees' knowledge, none of the projects would automatically trigger other actions which may require an EIS(s). Second, each of the project's performance does not depend on the previous or simultaneous performance of any other Phase IV action. Third, the projects are not an interdependent part of a larger Phase IV action.

Table 4-2. Phase IV Early Restoration Projects: Offset Types

PROJECT	LOCATION	OFFSET[1]
Texas Rookery Islands	TX	Pelican, gull, sandwich and royal terns and wading bird years
Restoring Living Shorelines and Reefs in Mississippi Estuaries	MS	Salt Marsh Habitat; benthic Secondary Productivity
Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore	MS[2]	Recreational use
Bon Secour National Wildlife Refuge Trail Enhancement Project, Alabama	AL[2]	Recreational use
Osprey Restoration In Coastal Alabama	AL	Piscivorous raptor bird years
Point aux Pins Living Shoreline	AL	Salt Marsh Habitat; Benthic Secondary Productivity
Shell Belt and Coden Belt Roads Living Shoreline	AL	Salt Marsh Habitat; Benthic Secondary Productivity
Seagrass Recovery Project at Gulf Islands National Seashore, Florida District	FL[2]	Submerged aquatic vegetation habitat
Sea Turtle Early Restoration	Gulf-wide	Adult reproductive equivalents for Kemp's ridley sea turtles, green sea turtles and loggerhead sea turtles
Pelagic Longline Bycatch Reduction Project	Gulf-wide	Kilograms of fish biomass; adult dolphin mortalities avoided; leatherback sea turtle adult mortalities avoided

[1] Offset Types indicated in this table provide general information about Offsets, for overview purposes only. Important, detailed information about Offsets is provided in project-specific write-ups included in Chapters 5-14.
[2] These projects will be implemented on federally managed lands and managed by DOI.

4.4 Habitat Equivalency Analysis (HEA) and Resource Equivalency Analysis (REA)

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., acres of marsh habitat) whereas REA is used to quantify changes in ecological services[2] in resource specific units (e.g., birds, oysters, etc.). When HEA or REA is used to estimate restoration credits, anticipated ecological benefits resulting from the proposed activity often are expressed in units that reflect the present (current) value over a project's lifespan. For purposes of the Early Restoration projects included in this document, the Trustees expressed HEA-estimated Offsets as "discounted service acre years" ("DSAYs")[3] of the specific habitat types to be restored.

REA-estimated benefits are expressed in resource-specific units, rather than on a habitat basis. For example, the Trustees estimated the present value of Offsets associated with Early Restoration projects focused on construction of living shorelines in terms of discounted kilogram years (DKg-Y) of benthic

[2] 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.

[3] 1 "DSAY" = the discounted (to a specified base year) services provided by one acre of habitat for one year.

secondary productivity (in addition to a habitat credit for living shorelines projects, estimated as DSAYs of salt marsh habitat).[4]

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 date at which ecological services from a restoration project are expected to begin 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.

HEA- and REA-based Offsets negotiated by the Trustees and BP use 2010 (the year of the Spill) as the base year and a 3.0 percent annual discount rate for calculation of present values.[5] For each of the Phase IV ecological Early Restoration projects, the Trustees and BP either agreed to:

- A primary Offset;
- A primary Offset, plus specified agreements on methods for converting Offset units if needed to better match units ultimately used in the Trustees' final assessment of injury;
- A primary Offset to be applied against a specified injury, and a secondary Offset to be applied only if the primary Offsets are in excess of the injury ultimately determined and quantified in the Trustees' final assessment of injury; or
- More than one Offset, reflecting project-specific evaluation of the types of benefits expected to be generated by a particular project.

Detailed information about Offsets negotiated for each Phase IV Early Restoration project is provided in subsequent chapters and Appendix C of this document.

4.5 Monetized Offsets

The expected benefits of some restoration projects can be monetized, or expressed in terms of the dollar value of expected benefits to the public, rather than in terms of ecological gains. As with HEA and REA, monetization approaches are used to estimate Offsets over a restoration project's expected lifespan. For this Final Phase IV ERP/EA, the Trustees used a monetizing approach to estimate Offsets for recreational use projects designed to achieve a range of goals, including:

- Enhancing public access to natural resources for recreational use;
- Enhancing recreational experiences; and/or
- Promoting environmental and cultural stewardship, education and outreach.

[4] 1 "DKG-Y" = the discounted (to a specified base year) kilograms of biomass generated by the project in one year, reflecting the expected survival and growth of that biomass during that year.

[5] It is standard practice to use a 3.0 percent annual discount rate for this type of analysis; please see (NOAA 1999) for a detailed discussion of the basis for its use.

More specifically, the Trustees relied on a benefit-to-cost ratio ("BCR") approach to estimate Offsets for the Phase IV Early Restoration recreational use projects. This approach uses existing economic literature and preliminary estimates of project inputs (see below for additional detail) to develop BCRs representing average benefit-to-cost ratios. For example, a project with an estimated cost of $10 and a BCR of 2.0 would be assigned a monetized Offset of $20. This monetized Offset would later be applied to monetized estimates of recreational use losses attributable to the Spill.

Estimated project inputs considered by Trustees as part of the process for developing BCRs for recreational use losses include, but are not limited to:

- The number of participants expected to benefit from each project;
- The benefit these individuals are expected to derive from a new experience or enhanced experience;
- The time frame over which the benefits would be provided, in terms of both start date as well as expected duration of benefits; and
- The discount rate used to calculate the present value of future benefits (3.0 percent, expressed in 2010 dollars).

The BCR is applied to the amount of Early Restoration funds that are provided by BP for a project, but not to funds provided from other sources.

The Trustees and BP agreed to apply a BCR 2.0 to the Phase IV recreational use projects. Thus, projects will provide BP with a monetized Offset equal to 2.0 times the project funding provided by BP, to be applied against monetized injuries to recreational use arising from the Spill.

4.6 Monitoring

NRDA regulations call on Trustees, when developing a restoration plan under OPA, to establish restoration objectives that are specific to the injuries (15 C.F.R. § 990.55(b)(2)). These objectives should clearly specify the desired project outcome, and the performance criteria by which successful restoration under OPA will be determined (15 C.F.R. § 990.55(b)(2)). The monitoring component of a restoration plan is further described in 15 C.F.R. § 990.55(b)(3).

A brief overview of the monitoring for the Phase IV projects is also provided in the "Performance Criteria Monitoring and Maintenance" sections of project-specific Chapters 5-14. The monitoring plans for each of the projects are provided in Appendix B of this document. These plans were designed to evaluate the effectiveness of each of the proposed restoration actions in meeting the restoration objectives and to assist in determining the need for corrective actions, if applicable. As applicable, these plans contain information on restoration objectives, performance criteria, specific monitoring actions to be taken or data to be collected, and expected monitoring timelines. While the Trustees generally strive for consistency in performance monitoring parameters, frequency, and duration for similar project types, flexibility in monitoring design is necessary to account for inherent differences between restoration

projects. The monitoring plans for most projects[6] will be refined as project siting and/or designs are finalized. In addition, for those projects that will include biological and structural sampling in the natural environment, the specifics regarding sampling techniques, timing, frequency, and locations could be modified in order to evaluate the established performance criteria.

4.7 Consistency with Project Evaluation Criteria

Chapters 5-14 of this document provide project-specific information addressing each project's consistency with project evaluation criteria. These criteria are summarized below for reference.

The following evaluation criteria are from the OPA regulations (15 C.F.R. § 990.54):

- 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.

If the Trustees conclude that two or more alternatives are equally preferable, the most cost-effective alternative must be chosen (15 C.F.R. § 990.54(b)).

The Framework Agreement states Early Restoration projects are to 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 Spill, 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 recreational 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

[6] BP and the Trustees agreed to work together to develop the monitoring plans for the Texas Rookery Islands and Sea Turtle Early Restoration projects. The monitoring plans included in Appendix B for these projects are the final plans developed with BP.

- Are feasible and cost-effective.

In addition, the introductions to Chapters 5-14 include additional, Trustee-specific information about their Early Restoration project screening process, beyond the general project screening information provided in Chapter 1, as applicable. Finally, to limit repetition in the discussion of OPA regulation's evaluation standards in the project information portions of Chapters 5-14, the Trustees note that:

- The potential of each project to cause collateral injury (15 C.F.R. § 990.54(a)(4)) is evaluated and that analysis is informed by each project's environmental consequence analysis; and
- The potential impact of each project on public health and safety (15 C.F.R. § 990.54(a)(6)), is addressed by each project's environmental consequence analysis where applicable for individual projects.

4.8 Environmental Compliance

Chapters 5-14 of this document provide detailed information and OPA and NEPA analyses for each Phase IV Early Restoration project, its expected environmental consequences and its consistency with the Final Phase III ERP/PEIS. In addition, coordination and reviews to ensure compliance with a variety of other legal authorities potentially applicable to the Phase IV Early Restoration projects have been initiated. While some of these reviews some may not be finalized before selection decisions on the projects included in this Final Phase IV ERP/EA are issued, the information available at release of this document indicates that all the projects would be able to meet permitting and other environmental compliance requirements prior to implementation and that all projects would be implemented in accordance with all applicable laws and regulations. Further, no on-the-ground work will commence for a Phase IV project until all permitting and environmental compliance requirements are met. Project-specific information and analyses regarding the environmental compliance status of Phase IV Early Restoration projects are provided below and in Chapters 5-14 of this document. After release of this Final Phase IV ERP/EA, the environmental compliance status for selected projects will continue to be updated and will be made available on the Gulf Spill Restoration website (http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/).

Examples of applicable laws or Executive Orders (EO) include, but are not necessarily limited to those listed below. Additional detail on each of these laws or Executive Orders EOs can be found in Chapter 7 of the Final Phase III ERP/PEIS. Project-specific Chapters 5-14 in this document contain additional on the outcomes of these consultations, conferences and reviews, where they are complete, including required conservation measures and/or BMPs where applicable. Wherever pre-existing consultations or permits are present, they were reviewed to determine if the consultations/permits are still valid or if a re-initiation of the consultations was necessary.

Potentially applicable laws and Executive Orders:

- Endangered Species Act (16 U.S.C. §§ 1531 *et seq.*)
- Migratory Bird Treaty Act (16 U.S.C. §§ 703 *et seq.*)
- Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801 *et seq*.)
- Marine Mammal Protection Act (16 U.S.C. §§ 1361 *et seq.*)

- Atlantic Tunas Convention Act (16 U.S.C. §§ 971 *et seq.*)[7]
- Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668 *et seq.*)
- Coastal Zone Management Act (16 U.S.C. §§ 1451 *et seq.*)
- Coastal Barrier Resources Act (16 U.S.C. §§ 3501 *et seq.*)
- Clean Air Act (42 U.S.C. §§ 7401 *et seq.*)
- Federal Water Pollution Control Act (Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*) and/or Rivers and Harbors Act (33 U.S.C. §§ 401 *et seq.*)
- National Historic Preservation Act (16 U.S.C. §§ 470 *et seq.*)
- EO 13112: Invasive Species
- EO 11988: Floodplain Management (now as augmented by EO 13690, January 30, 2015)[8]
- EO 11990: Protection of Wetlands
- EO 12114[9]: Environmental Effects Abroad of Major Federal Actions
- EO 12898: Environmental Justice
- EO 12962: Recreational Fisheries
- EO 13112: Invasive Species
- EO 13175: Consultation and Coordination with Indian Tribal Governments
- EO 13186: Responsibilities of Federal Agencies to Protect Migratory Birds
- EO 13653: Preparing the United States for the Impacts of Climate Change, November 1, 2013[10]

4.9 Overview Summary of Phase IV Early Restoration Projects

Figure 4-1 below identifies the location(s) for each Phase IV project. The following subsections list and briefly describe each of the ten projects.

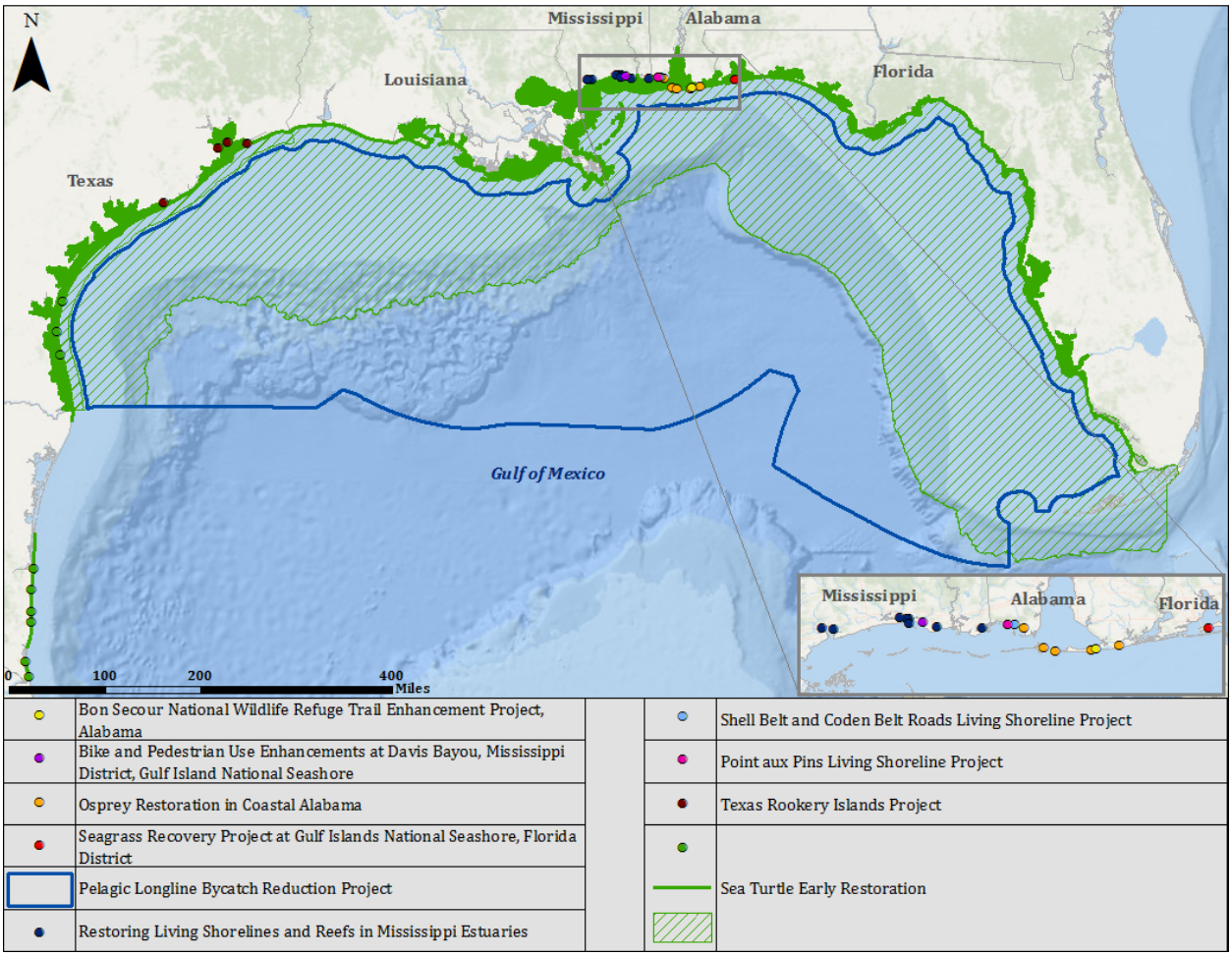
[7] Not described in the Final Phase III ERP/PEIS, the ATCA was enacted in 1975 to ratify the United States' participation in the International Convention for the Conservation of Atlantic Tunas (ICCAT). The goal of ICCAT is to conserve and protect highly migratory tunas and tuna-like species in the Atlantic Ocean and adjacent seas.

[8] Executive Order 11988, requires agencies to avoid, to the extent possible, adverse impacts associated with the occupancy and modification of floodplains and to avoid floodplain development wherever there is a practicable alternative. The January 2015 E.O. amends E.O. 11988, and, among other items, directs agencies to use natural systems, ecosystem processes, and nature-based approaches when developing alternatives for consideration where possible. It also provides three approaches that federal agencies can use to establish the flood elevation and hazard area for consideration in their decisionmaking.

[9] Compliance with EO 12114 is being addressed through this NEPA environmental analysis

[10] Not described in the Final Phase III ERP/PEIS, EO 13653 was issued in order to prepare the Nation for the impacts of climate change by undertaking actions to enhance climate preparedness and resilience.

Figure 4-1. Phase IV Early Restoration Project Locations



4.9.1 Texas Rookery Islands

The Texas Rookery Islands project will restore and protect three rookery islands in Galveston Bay and one rookery island in East Matagorda Bay using coastal engineering techniques. The primary goal of the project is to increase nesting of colonial waterbirds, including brown pelicans, gulls, terns (royal and sandwich terns), and wading birds (great blue herons, roseate spoonbills, reddish egrets, great egrets, snowy egrets, tricolored herons, and black-crowned night herons). Restoration actions at each rookery island will increase the amount of available nesting habitat by expanding the size of the island and enhancing the quality of habitat for nesting birds. Habitat longevity will be increased raising the island elevation and constructing protective features, such as breakwaters or armoring levees. These restoration actions will result in an increase in the numbers of nesting colonial waterbirds. Rookery islands in Galveston Bay include Dickinson Bay Island II, located within Dickinson Bay; Rollover Bay Island, located in East (Galveston) Bay; and Smith Point Island, located west of the Smith Point Peninsula. Dressing Point Island lies in East Matagorda Bay, and is part of the Big Boggy National Wildlife Refuge.

4.9.2 Restoring Living Shorelines and Reefs in Mississippi Estuaries

The Restoring Living Shorelines and Reefs in Mississippi Estuaries project will restore intertidal and subtidal reefs and use living shoreline techniques in four bays. Projects actions will take place in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay, all located in Jackson, Harrison, and Hancock counties. The project will provide for the construction of more than four miles of breakwaters, five acres of intertidal reef habitat and 267 acres of subtidal reef habitat across the Mississippi Gulf Coast.

4.9.3 Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore

This project will involve implementing roadway improvements for pedestrians and bicyclists in the Davis Bayou Area of Gulf Islands National Seashore. In response to prior public scoping meetings conducted outside of the Early Restoration process, NPS developed two action alternatives for this project. The NPS Preferred Alternative will widen the existing road surface on Park Road and Robert McGhee Road to accommodate multiple-use bicycle-pedestrian lanes. The other alternative would reduce the amount of automobile traffic in the park by limiting access to VFW Road during certain times of the day. Both alternatives would include two traffic-calming medians on Park Road.

4.9.4 Bon Secour National Wildlife Refuge Trail Enhancement Project, Alabama

This project will involve repairing and improving, to an American with Disabilities Act (ADA) standard, an existing trail (Jeff Friend Trail) on Bon Secour National Wildlife Refuge (BSNWR). The BSNWR is located on the Gulf Coast, 8 miles west of the city of Gulf Shores, Alabama, in Baldwin and Mobile counties. This aged boardwalk and gravel trail will be repaired and improved to ensure safe public access and to enhance the quality of visitor experience. An observation platform will also be constructed along the trail, and two handicapped parking spaces will be widened to better accommodate visitors. The project

is not expected to significantly increase visitation, but rather to provide a safe and enhanced experience for visitors to the Refuge.

4.9.5 Osprey Restoration in Coastal Alabama

The restoration project will install five osprey nesting platforms along the coast in Mobile and Baldwin Counties, Alabama in order to provide enhanced nesting opportunities for pisciverous (fish-eating) raptors.

4.9.6 Point aux Pins Living Shoreline

The Point aux Pins Living Shoreline project will employ living shoreline techniques that utilize natural and/or artificial breakwater materials to stabilize shorelines along an area in Portersville Bay in the Mississippi Sound near Point aux Pins in Mobile County, Alabama. The project will be located adjacent to an existing living shoreline project previously constructed by the ADCNR utilizing other funding sources.

Construction activities will include placement of breakwater materials along the shoreline to dampen wave energy and reduce shoreline erosion while also providing habitat and increasing benthic secondary productivity. The specific breakwater elevations, construction techniques and design will be developed to maximize project success and meet regulatory requirements. Over time, the breakwaters are expected to provide habitat that supports benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, crabs, and small forage fishes.

4.9.7 Shell Belt and Coden Belt Roads Living Shoreline

The Shell Belt and Coden Belt Roads Living Shoreline project will employ shoreline restoration techniques to increase benthic productivity and enhance the growth of planted native marsh vegetation. The project will be located in the Portersville Bay portion of Mississippi Sound, seaward of the southernmost portions of Shell Belt and Coden Belt Roads in Coden, Alabama. This project will be constructed to dampen wave energy and protect newly planted emergent vegetation while also providing habitat and increasing benthic secondary productivity. The specific breakwater elevations, construction techniques and design will be developed to maximize project success and meet regulatory requirements. Over time, the breakwaters are expected to develop into reefs that support benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, and crabs. Marsh vegetation is expected to become established further enhancing both primary and secondary productivity adjacent to the breakwaters.

4.9.8 Seagrass Recovery Project at Gulf Islands National Seashore, Florida District

The Seagrass Recovery project at Gulf Islands National Seashore's Florida District will restore shallow seagrass beds in the Florida panhandle. It will restore 0.02 acres of seagrass injured by propeller scars, blow holes and human foot traffic, primarily in turtle grass (*Thallassia testudinum*) on DOI-managed lands located along the south side of the Naval Live Oaks Preserve in Santa Rosa Sound, in Santa Rosa

County, Florida. Project activities will include harvesting and transplanting seagrass, installing bird stakes to condition sediments to promote seagrass survival, and installing signage to educate visitors about the restoration project and the ecological importance of seagrass.

4.9.9 Sea Turtle Early Restoration

The Sea Turtle Early Restoration project is a multi-faceted approach to restoration that collectively addresses identified needs for a variety of species and life stages of sea turtles, consistent with long-term recovery plans and plan objectives for sea turtles in the Gulf of Mexico. The Sea Turtle Early Restoration project consists of four complementary project components:

- The Kemp's Ridley Sea Turtle Nest Detection and Enhancement project component will provide needed additional staff, infrastructure, training, education activities, equipment, supplies, and vehicles over a 10-year period in both Texas and Mexico for Kemp's ridley sea turtle nest detection and protection.
- The Enhancement of the Sea Turtle Stranding and Salvage Network (STSSN) and Development of an Emergency Response Program project component will enhance the existing STSSN beyond current capacities for 10 years in Texas and across the Gulf as well as develop a formal Emergency Response Program within the Gulf of Mexico.
- The Gulf of Mexico Shrimp Trawl Bycatch Reduction component will enhance two existing NOAA programs which will work to reduce the bycatch of sea turtles in shrimp trawls in the Gulf of Mexico. The two programs are the Gear Monitoring Team (GMT) and the Southeast Shrimp Trawl Fisheries Observer Program (Observer Program).
- The Texas Enhanced Fisheries Bycatch Enforcement component will enhance TPWD enforcement activities for fisheries that incidentally catch sea turtles while they operate primarily in Texas State waters within the Gulf of Mexico, for a 10-year period.

4.9.10 Pelagic Longline Bycatch Reduction Project

The Pelagic Longline Bycatch Reduction Project will restore open-ocean (pelagic) fish that were affected by the spill. The Gulf pelagic longline (PLL) fishery primarily targets yellowfin tuna and swordfish, but incidentally catches and discards other fish, including marlin, sharks, bluefin tuna, and smaller individuals of the target species. The project aims to reduce the number of fish accidentally caught and killed in fishing gear by compensating PLL fishermen who agree to voluntarily refrain from PLL fishing in the Gulf during an annual six-month repose period that coincides with the bluefin tuna spawning season. The project will also provide participating fishermen with two alternative gear types to allow for the continued harvest of yellowfin tuna and swordfish during the repose period when PLL gear is not used.

4.10 Potential Cumulative Impacts

The CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined as "the impact

on the 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" (40 C.F.R. § 1508.7). As stated in the CEQ handbook, "Considering Cumulative Effects" (CEQ 1997), cumulative impacts need to be analyzed in terms of the specific resource, ecosystem, and human community being affected and should focus on effects on "important issues of national, regional, or local significance." Following the CEQ guidance, the goal is not to capture every theoretically possible impact, but instead "to count what counts."

In accordance with CEQ guidance, "An analysis of the cumulative impacts for each resource [should] be provided in each level of review, either by relying upon the analysis in the programmatic NEPA review or adding to that analysis in the tiered NEPA review, either approach facilitated by incorporating by reference the cumulative impact analysis provided in the programmatic NEPA review" (CEQ 2014).

4.11 Phase IV Projects Cumulative Impacts Methodology

In the context of the Phase IV Early Restoration Plan , cumulative impacts assessments undertake four primary steps:

(1) **Define appropriate spatial and temporal boundaries for the analysis**. The spatial boundary is the area where past, present, and reasonably foreseeable future actions have, are, or could take place and result in cumulative impacts to the affected resource when combined with the impacts of the alternatives being considered. The action area for the analysis is defined for each project.

(2) **Describe baseline environmental and/or socioeconomic conditions for affected resources within the spatial and temporal boundaries**. Existing environmental and socioeconomic conditions in and around the proposed project locations are represented by the current state of the affected environment, as described in Chapter 2 and Chapters 5-14 of this Final Phase IV ERP/EA.

(3) **Identify past, present and reasonably foreseeable future government and private actions that could have or contribute to potentially significant impacts on the affected resources**. The categories of potentially relevant past, present, and reasonably foreseeable future actions discussed in the Final Phase III ERP/PEIS included:

- Restoration related to the *Deepwater Horizon* spill;
- Other relevant environmental stewardship and restoration activities;
- Military operations;
- Marine transportation;
- Energy activities;
- Marine mineral mining, including sand and gravel mining;
- Coastal development and land use;
- Fisheries and aquaculture; and
- Tourism and recreation.

Actions that would be relevant to the Phase IV projects' cumulative impacts analysis are defined as those with similar scope, timing, impacts or location.

(**4) Characterize the cumulative impacts of the project assuming implementation of the other present and reasonably foreseeable future actions.** Chapters 5-14 describe the cumulative impacts of the Phase IV projects when combined with other past, present, and reasonably foreseeable future actions.

Rather than repeat the presentation of the cumulative impacts analysis presented in the Phase III ERP/PEIS, the Trustees reviewed the list of current and planned projects identified in Chapter 6 of that document. Relevant local and site-specific past, present and reasonably foreseeable future actions not analyzed in the Phase III ERP/PEIS were identified through communications with agencies and organizations and review of publicly available databases of planned projects relevant to the proposed Phase IV projects. The Trustees then determined whether the proposed Phase IV projects would contribute substantially to adverse cumulative impacts when added to past, present or reasonably foreseeable future actions.

4.12 Other NEPA Considerations

4.12.1 Unavoidable Adverse Impacts

Section 102(2)(C)(ii) of NEPA, 42 U.S.C. § 4332(2)(C)(ii), requires that an EIS include information on any adverse environmental effects that cannot be avoided, should the proposed action be implemented. Unavoidable adverse impacts are the effects on the human environment that would remain after mitigation measures have been applied. Unavoidable adverse impacts do not include temporary or permanent impacts that would be mitigated. While these impacts do not have to be avoided by the planning agency, they must be disclosed, considered and mitigated where possible (40 C.F.R. § 1500.2(e)). For some projects, mitigation measures are identified as options that can be used to avoid, reduce, minimize or mitigate these impacts. Unavoidable adverse impacts associated with conversion of habitat and built infrastructure are disclosed for relevant Phase IV projects where they are reasonably foreseeable. Chapters 5-14 consider the extent to which adverse impacts can be avoided, including consideration of appropriate mitigation, and describe where appropriate, adverse impacts that are unavoidable.

4.12.2 Relationship Between Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Federal Agencies must discuss "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 C.F.R. § 1502.16). The Final Phase III ERP/PEIS found that for a number of project types, such as creating and improving wetlands, protecting shorelines and reducing erosion, and restoring barrier islands and beaches, short-term adverse impacts generally include those associated with construction or implementation of restoration activities. Many of these impacts would be temporary and were not expected to reduce long-term productivity. However, these project types were intended to enhance long-term productivity.

The Final Phase III ERP/PEIS found that a number of project types were intended to provide and enhance recreational opportunities that would increase access to, and the recreational use of, resources. Dependent on how those uses are managed, these project types could result in both short-term and long-term impacts to habitats and resources. However, those impacts were not expected to degrade long-term productivity. Overall, the alternatives considered were expected to enhance long-term productivity.

The purpose of the Phase IV projects is to accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. This Final Phase IV ERP/EA will complement previous investments in Early Restoration in accordance with OPA and funding made available under the Framework Agreement. In order to meet this purpose, the Trustees are selecting projects that are intended to improve certain aspects of the human environment which will result in the maintenance and enhancement of the long-term productivity of a number of natural resources. Chapters 5-14 describe in detail the types of short- and long-term adverse impacts and/or benefits that would be expected for the different resource categories from each project.

4.12.3 Irreversible and Irretrievable Commitment of Resources

Federal Agencies must discuss "any irreversible and irretrievable commitment of resources which would be involved in the proposed action should it be implemented" (40 C.F.R. § 1502.16). For purposes of this analysis, a commitment of a resource incudes such things as agency funding or staff necessary to undertake a project.

Implementation of any of the Phase IV projects will require an irreversible and irretrievable commitment of resources including staff time for project planning and development and the associated funding necessary to go through the consultation, coordination and decision-making processes. Other resource use that would be irreversible and irretrievable would be the use of energy through the combustion of fossil fuels and material resources for construction. However, the level of commitment is likely to vary based on the project. Chapters 5-14 describe in detail, where appropriate, the types of resource commitments expected for the different resource categories from each project.

4.12.4 Climate Change and NEPA

In 2014, the CEQ issued revised draft guidance on considering the effects of climate change and greenhouse gas emissions in the analysis of proposed action under NEPA (CEQ 2014). The draft climate change guidance also suggests ways that federal agencies should consider effects of climate change in developing projects that are resilient in nature and able to adapt to changes in the existing environmental conditions over time.

Consideration of coastal vulnerability from climate change factors is important in planning. The Intergovernmental Panel on Climate Change (IPCC) defines vulnerability as "the propensity or predisposition to be adversely affected…encompassing[ing] a variety of concepts including sensitivity to harm and lack of capacity to cope and adapt" (IPCC 2014). Factors affecting coastal vulnerability include the physical characteristics of a particular setting and climate and non-climate drivers (Burkett and

Davidson 2012). Climate drivers include sea level change, waves and currents, winds, storminess, atmospheric carbon dioxide, atmospheric temperature, water properties, sediment supply, and groundwater availability (Burkett and Davidson 2012). Consideration of factors such as sea level rise, changes to shorelines and altered hydrology at the project design stage has allowed, and will allow, for the anticipation of a range of environmental changes and the development of Early Restoration projects that would be more resilient over time.

Executive Order 13653 ("Preparing the United States for the Impacts of Climate Change", November 1, 2013) reinforces the direction to undergo planning efforts to develop projects that are more resilient to changes in the environment over time as a result of climate change effects). It states that the Federal Government must build on recent progress and pursue new strategies to improve the Nation's preparedness and resilience. In doing so, Federal agencies should promote: (1) engaged and strong partnerships and information sharing at all levels of government; (2) risk-informed decision-making and the tools to facilitate it; (3) adaptive learning, in which experiences serve as opportunities to inform and adjust future actions; and (4) preparedness planning. This Executive Order and guidance was considered during the planning for the Phase IV projects.

4.13 Adoption of Existing NEPA Analyses

Federal agencies are encouraged to coordinate and take appropriate advantage of existing NEPA documents and studies, including adoption and incorporation by reference. Under CEQ NEPA Regulations (40 C.F.R. § 1506.3), DOI NEPA Regulations (43 C.F.R. § 46.120), and individual DOI bureau NEPA procedures, DOI may adopt another federal agency's NEPA analysis to streamline the NEPA compliance process.

DOI may adopt another federal agency's NEPA analysis or portion thereof if it meets the standards for an adequate analysis under the CEQ NEPA regulations, and if it adequately assesses the environmental effects of the proposed action and reasonable alternatives (40 C.F.R. § 1506.3(a); 43 C.F.R. § 46.120(c)). If DOI adopts another agency's NEPA analysis, the supporting record must include an evaluation of whether new circumstances, new information or changes in the action or its impacts not previously analyzed may result in significantly different environmental effects (43 C.F.R. § 46.120(c)).

One of the components of the Sea Turtle Early Restoration project has an existing NEPA analysis, originally prepared by NPS ("Expansion of Facilities Supporting Sea Turtle Science and Recovery, Construction of Patrol Cabins and Expansion of Incubation Laboratory, 2011"). The EA contains a relevant analysis for a portion (infrastructure) of the Kemp's Ridley Nest Detection and Enhancement component of the Sea Turtle Early Restoration project and is analyzed in part in the NPS NEPA document. In this case, a DOI Bureau (USFWS) is adopting another Bureau's (NPS) EA. As the lead agency for preparation of this Final Phase IV ERP/EA, DOI through its Authorized Official is responsible for determining the adequacy of any NEPA analysis that DOI intends to adopt.

DOI has independently evaluated the existing NEPA analysis pertinent to the Phase IV Sea Turtle Early Restoration project. DOI has determined that the existing NEPA analysis meets the standards for

adequate NEPA analysis under the CEQ NEPA regulations, and that it adequately assesses the environmental effects of a portion of the project. All applicable environmental commitments previously made in the adopted NEPA document are incorporated by reference into the Phase IV Sea Turtle Early Restoration project analysis. Accordingly, DOI adopts the NEPA analysis and incorporates it into this document. This NEPA analysis can be found in Appendix F.

4.14 References

Burkett, V.R. and Davidson, M.A. [Eds.]. (2012). *Coastal Impacts, Adaptation and Vulnerability: A Technical Input to the 2012 National Climate Assessment*. Cooperative Report to the 2013 National Climate Assessment, pp. 150.

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Chapter 5: Texas Rookery Islands Project

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5.1 Restoration and Protection of Texas Rookery Islands: Project Description

The Texas Rookery Islands project consists of restoration and protection actions on four rookery islands (Dickinson Bay II, Rollover Bay, Smith Point, and Dressing Point).

Within the remainder of this chapter, there is a subsection that provides a general description of each of the project's four islands with relevant background information. The following discussions embody the entire project, representing all four islands, and include the project's consistency with project evaluation criteria; a description of planned performance criteria, monitoring and maintenance; a description of the type and quantity of Offsets BP will receive for funding the Texas Rookery Island project; and information about estimated project costs.

Section 5.2 includes the Environmental Assessment for the project. The Texas Rookery Islands project is analyzed and described as one EA comprised of two sections, based on geographic location and observed similarities among the four islands. Each of the two sections includes resource specific discussions on the affected environment and an analysis of the anticipated environmental consequences involved with the project. After the two sections, there is a synopsis that summarizes the overall impacts of the project. The two sections of the project EA are separated by bay, Galveston or East Matagorda, and include these rookery islands:

1. Galveston Bay, which addresses Dickinson Bay II, Rollover Bay, and Smith Point Islands; and
2. East Matagorda Bay, which addresses Dressing Point Island.

5.1.1 Project Summary

The Texas Rookery Islands project will restore and protect three rookery islands in Galveston Bay and one rookery island in East Matagorda Bay using coastal engineering techniques (Figure 5-1).

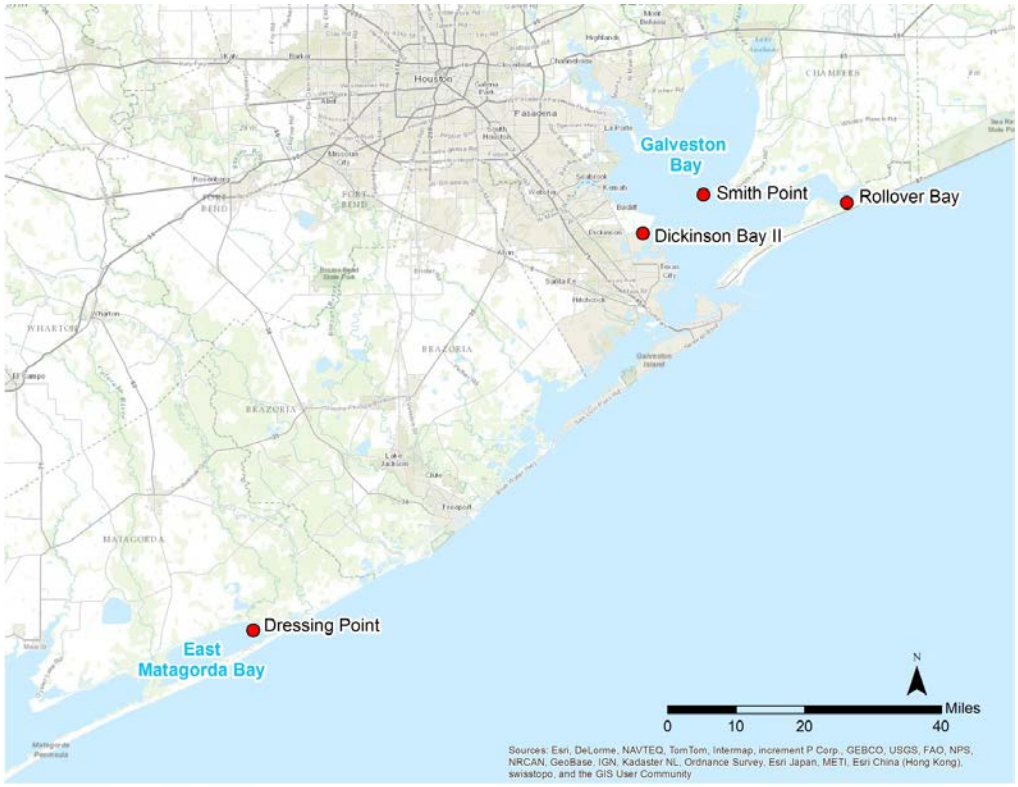
The primary goal of the project is to partially compensate for injuries to birds by increasing nesting pairs of colonial waterbirds, which include the following species:

- brown pelican, *Pelicanus occidentalis*
- laughing gull, *Leucophaeus atricilla*
- royal tern, *Thalasseus maxima*
- sandwich tern, *Thalasseus sandvicensis*
- great blue heron, *Ardea herodias*
- roseate spoonbill, *Platalea ajaja*
- reddish egret, *Egretta rufescens*
- great egret, *Ardea alba*
- snowy egret, *Egretta thula*
- tricolored heron, *Egretta tricolor*, and

- black-crowned night heron, *Nycticorax nycticorax.*

Restoration actions at each rookery island will increase the amount of available nesting habitat by expanding the size of the island and enhancing the quality of habitat for nesting birds. Habitat longevity will be increased by raising the island elevation and constructing protective features, such as breakwaters or armoring levees. These restoration actions will result in an increase in the numbers of nesting colonial waterbirds. Rookery islands in Galveston Bay include Dickinson Bay Island II, located within Dickinson Bay; Rollover Bay Island, located in East (Galveston) Bay; and Smith Point Island, located west of the Smith Point Peninsula. Dressing Point Island lies in East Matagorda Bay, and is part of the Big Boggy National Wildlife Refuge.

Figure 5-1. Texas Rookery Islands Project Locations



5.1.2 Background and Project Description

Preliminary engineering has been completed for the Dickinson Bay II and Dressing Point Islands. The plans developed for Smith Point and Rollover Bay Islands are currently conceptual in design. Refined design and construction specification packages for each of the islands will be developed by professional licensed engineers (PE) with coastal restoration experience. The following descriptions for each of the island construction elements are preliminary and based on current planning efforts and resource agency experience with similar projects. Table 5-1 summarizes the proposed construction tasks for each island.

Table 5-1. Proposed Restoration and Protection Actions

RESTORATION AND PROTECTION ACTIONS	RESTORATION OUTCOME
Dickinson Bay Island II (Galveston Bay)	
Construct 4 island acres by placing clean fill over submerged land	Constructed rookery island acres restores nesting habitat for colonial waterbirds
Construct 2,000 feet of armored levees	Armored levees contain island material, protect the island from erosion, and maintain structure for the expected lifespan of the project
Build 0.8 acres of submerged levee	Submerged levee creates a water/shore interface for avian use and provides wave protection
Plant 3.5 island acres with native scrub-shrub vegetation	Enhanced scrub-shrub habitat provides nesting for colonial waterbirds (wading birds)
Rollover Bay Island (Galveston Bay)	
Construct 10 island acres by placing clean fill over submerged land or existing island	Constructed rookery island acres restores nesting habitat for colonial waterbirds
Construct 4,500 feet of armored levees	Armored levees contain island material, protect the island from erosion, and maintain structure for the expected lifespan of the project
Plant 4 island acres with native scrub-shrub vegetation	Enhanced scrub-shrub habitat provides nesting for colonial waterbirds (wading birds)
Smith Point Island (Galveston Bay)	
Construct 6 island acres by placing clean fill over submerged land	Constructed rookery island acres restores nesting habitat for colonial waterbirds
Enhance 2,000 feet of existing breakwater	Breakwaters contain island material, protect the island from erosion, and maintain structure for the expected lifespan of the project
Construct 250 feet of new breakwater	
Raise the elevation of 2 acres of shell beach	Shell beach provides nesting habitat for colonial waterbirds
Plant 3 island acres with native scrub-shrub vegetation	Enhanced scrub-shrub habitat provides nesting for colonial waterbirds (wading birds)
Dressing Point Island (East Matagorda Bay)	
Construct 5 island acres by placing clean fill over submerged land and raise the elevation on 2 acres of existing island	Constructed rookery island acres restores nesting habitat for colonial waterbirds
Construct 5,000 feet of new breakwater	Breakwaters protect the island from erosion, and maintain structure for the expected lifespan of the project
Raise the elevation of an existing shell knoll to build 0.35 acres of emergent shell hash	Shell hash knoll provides nesting habitat for colonial waterbirds
Plant 7 island acres with native scrub-shrub vegetation	Enhanced scrub-shrub habitat provides nesting for colonial waterbirds (wading birds)

The general conceptual design for the restoration and protection of the rookery islands will include raising the elevation and area of the islands using clean fill material, building structures to reduce erosion and to contain fill material (armored levees, breakwaters, and/or temporary levees), planting native scrub-shrub habitat for wading birds, gulls, and brown pelicans on all four islands and, for Smith Point and Dressing Point Islands, creating or enhancing habitat for ground nesting terns. For ground nesting terns, shell or shell-like material will be placed in shallow water or on the island itself to raise elevations. Island construction will use clean sediments consisting of clay, silts, and sand, which will be sculpted to prescribed slopes and elevations. Once the earthen fill has dewatered and sediments have settled, portions of the island will be planted with native scrub-shrub vegetation. The islands will be protected by armored levees or breakwaters to ensure longevity of the restored habitat against forces that caused the loss of the original islands. The final elevation of the improved island will be such that it will support nesting species of colonial waterbirds.

5.1.2.1 Galveston Bay Rookery Islands

Galveston Bay supports several colonial waterbird islands. The area is able to support a diverse and abundant waterbird community. These birds are supported by significant areas of estuarine and palustrine wetlands combined with opportunities for nesting on isolated and protected islands. Changes in the bay such as relative sea level rise, increased erosion rates, human disturbance, increased predation, and sediment management practices have resulted in reduced opportunities for nesting colonial birds. The intent of this project is to reverse that declining trend.

Restoration and protection of the Galveston Bay rookery islands supports the needs or goals of several conservation plans. These plans include but are not limited to the following national, state and regional planning documents:

- The Galveston Bay Plan: The Comprehensive Conservation and Management Plan for the Galveston Bay Ecosystem (Galveston Bay Estuary Program [GBEP] 1994);
- Galveston Bay Habitat Conservation Blueprint: A Plan to Restore the Habitats and Heritage of Galveston Bay Habitat (Galveston Bay Foundation 1998);
- Waterbird Conservation for the Americas: The North American Waterbird Conservation Plan, Version 1 (Kushlan et. al. 2002);
- Southeast United States Regional Waterbird Conservation Plan (U.S. Fish and Wildlife Service [USFWS] and North Carolina Audubon Society 2006);
- Strategic Plan: The Coastal Program Stewardship of Fish and Wildlife Through Voluntary Conservation Regional Step-Down Plan Region 2 (Texas) Part 2 of 3 FY 2006-2010 (USFWS 2006);
- Charting the Course to 2015: Galveston Bay Strategic Action Plan (GBEP 2009);
- Gulf Coast Joint Venture Conservation Planning for Reddish Egret (Vermillion and Wilson 2009);

- Texas Conservation Action Plan 2012 – 2016: Gulf Coast Prairies and Marshes Handbook (Texas Parks and Wildlife Department [TPWD] 2012);
- Texas Mid-Coast Initiative Area Fact Sheet (Gulf Coast Joint Venture 2012);
- Reddish Egret Conservation Action Plan (Wilson et. al. 2014); and
- Draft Texas Colonial Waterbird Rookery Island Conservation Plan (Audubon Texas 2014).

The information provided in each of the planning documents listed above may be for a specific species or may target a group or guild of waterbirds. Actions or recommendations in each may be directly related to restoration of a specific island such as Smith Point Island; typical nesting islands; or they may emphasize the need of a species that will benefit from the three Galveston Bay Rookery Islands described herein.

5.1.2.1.1 Dickinson Bay Island II

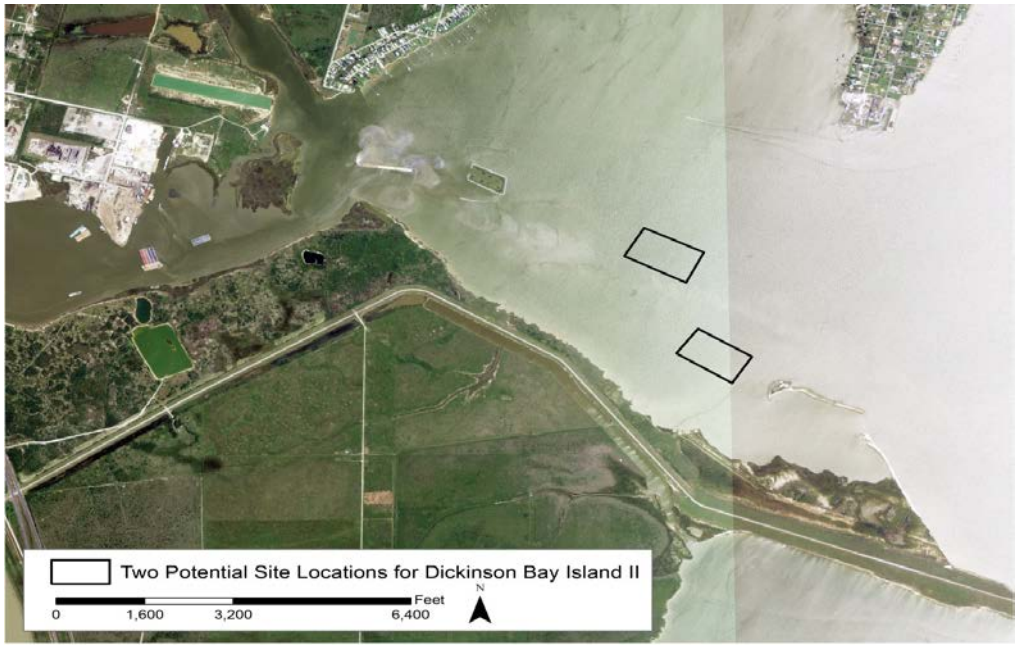
In 1934, the U.S. Army Corps of Engineers (USACE) constructed three islands in Dickinson Bay with dredged material from the Dickinson Channel Project. Historically, these three islands supported colonial waterbirds along the Dickinson Bay Channel (historical charts of these islands can be viewed here http://historicalcharts.noaa.gov/historicals/preview/image/519-10-1966). These islands suffered severe erosion and by the 1970s no longer supported nesting birds. Subsidence from severe groundwater withdrawal and long-term erosion, exacerbated by a series of tropical storms in the 1990s, resulted in the complete loss of all three islands. The loss of these islands created a void in available nesting habitat in that area of Galveston Bay. Groundwater regulatory measures have resulted in a substantial decrease in the rate of subsidence in the Galveston Bay Region, including Dickinson Bay. The design for the restoration and protection of Dickinson Bay Island II will take into consideration methods to protect the island from future land loss associated with erosion and relative sea level rise. Restoration and protection will also restore the island's size and elevation such that it will provide sufficient area and height to support colonial nesting birds.

In the spring of 2002, agency, advocacy, and industry partners met to address the habitat loss in Dickinson Bay and to evaluate the potential to restore the three lost islands. The Galveston Bay Foundation and partners began planning to restore the three islands to support colonial waterbirds. With guidance provided by multiple conservation and management plans, the partnership completed the successful restoration of one of the islands in 2004, Dickinson Bay Island I.

Dickinson Bay Island II and III are currently in the preliminary engineering design stage. The Dickinson Bay Bird Nesting Islands Alternatives Analysis (Alternatives Analysis) was completed in 2014 (HDR Engineering [HDR] 2014). The scope of the Alternatives Analysis was to create conceptual designs for two islands that would support shore nesting bird habit. Design criteria for the islands were established for the project sites and consisted of wind, wave, tide, and storm conditions. The document summarized survey, benthic, and initial geotechnical investigations performed under previous investigations and detailed in the Data Collection Memorandum (HDR 2013). Additional geotechnical investigations were performed as part of the Alternatives Analysis, along with the summarization of meteorological and

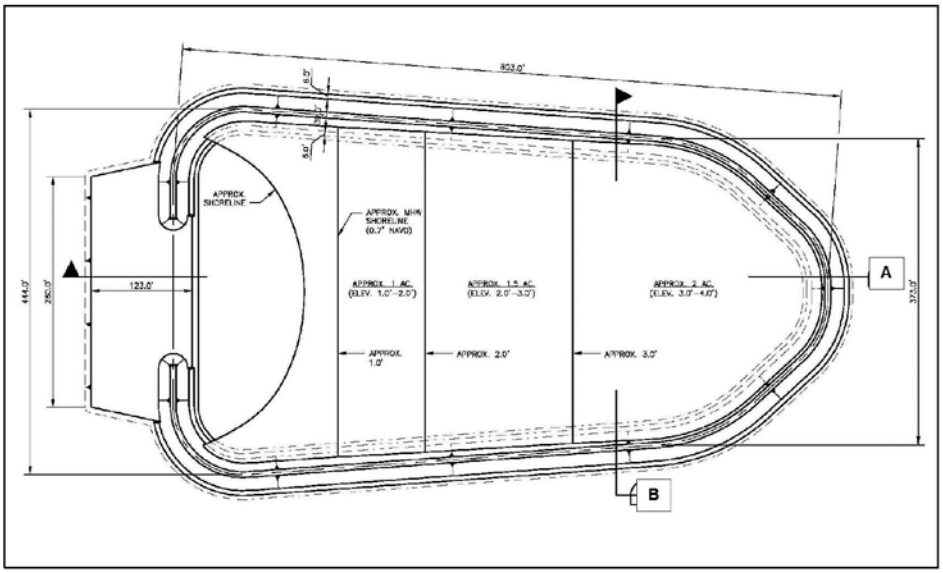
oceanographic conditions at the sites. For this Early Restoration effort, the Trustees are targeting Dickinson Bay Island II for restoration. One of two potential sites under evaluation would be chosen for construction of Dickinson Bay Island II (Figure 5-2). Dickinson Bay Island III is not part of this project and will not be discussed.

Figure 5- 2. One of two potential sites would be chosen for construction of Dickinson Bay Island II



After construction is completed, the island footprint will be approximately 4 acres. To accomplish this, armored and potentially temporary levees will be constructed to contain fill material. The restored island will be protected by approximately 2,000 feet of armored levees around three sides of its perimeter. The remaining open side of the island will be bounded by a submerged levee. About 3.5 acres of the restoration area will be planted with native scrub-shrub vegetation. The submerged levee incorporated into the design serves to create a water/shore interface that will facilitate the use of the island by avian species. The preliminary design is shown in Figure 5-3.

Figure 5-3. Preliminary design drawing of the Dickinson Bay Island II restoration, showing the potential footprint of the fill material and armored levee



5.1.2.1.2 Rollover Bay Island

Rollover Bay Island is located north of the Gulf Intracoastal Waterway (GIWW) within Rollover Bay, a sub-bay of East (Galveston) Bay near Rollover Pass. Rollover Pass is a tidal connection from East Bay to the Gulf of Mexico. The natural pass was deepened and enlarged to enhance migration of fisheries resources between the bay and the Gulf. Over time, several dredged material placement islands (approximately 11 islands) were created adjacent to the GIWW during excavation and maintenance of the GIWW. Erosion and subsidence have decreased the size of Rollover Bay Island from greater than 5 acres in 1982 to less than 2 acres in 2013. In 2013, the erosion to Rollover Bay Island was so severe that 30% of the island was lost in one year. The island supports limited colonial waterbird nesting and little species diversity due to its diminishing size and habitat loss. Limited to no nesting took place during 2013 and 2014 on what remains of the island (Hackney and Woodrow, pers. comm. 2014). Historically, the island supported multiple nesting bird species, including brown pelican, wading birds, laughing gulls, and terns.

Based on evaluation of on-site conditions and review of aerial imagery, most of the chronic erosion appears to be the result of northerly winds associated with the passage of seasonal cold fronts and the long fetch from East Bay. However, tropical storm events have adversely affected the island in the past, during overwash events with Hurricane Alex in July 2010 and Hurricane Ike in September 2008. The engineering design phase of the island will evaluate tidal and wave actions in the area to ensure that

forces associated with tropical storms, the East Bay fetch, GIWW traffic, and Rollover Pass are considered. This will also include protecting the island from the effects of relative sea level rise. The proposed restoration and protection measures will restore the island's size and elevation such that it will provide sufficient area and height to support colonial nesting birds.

After construction is completed, the island footprint will be approximately 10 acres. To accomplish this, permanent- armored and temporary levees will be constructed to contain clean fill material. The restored island will be protected by approximately 4,500 feet of armored levees along its vulnerable sides. About 4 acres of the restoration area will be planted with native scrub-shrub vegetation. The island will be sloped into the tidal zones at both ends of the island to provide water access for juvenile colonial waterbirds. Restoration and protection of Rollover Bay Island will require the placement of material on the submerged bay bottom, which may impact hard shell substrate, a valued benthic substrate in Galveston Bay. Any impacts incurred after avoidance and minimization measures are taken will be fully mitigated by restoring an equal or greater amount of submerged hard substrate. The conceptual drawing is shown in Figure 5-4.

Figure 5-4. Conceptual drawing of the proposed Rollover Bay Island restoration, illustrating the footprint of the breakwater/levee, fill, and vegetation planting area



5.1.2.1.3 Smith Point Island

Smith Point Island is located just west of the Smith Point peninsula that reaches into Galveston Bay between Trinity Bay and East Bay. The island targeted for restoration was a natural oyster reef island shown on maps as far back as 1921. The island was significantly enhanced in 1950 when the Channel to Smith Point was created. It may have received additional material from dredged material excavated for the navigation channel in 1972. The island has eroded and subsided since 1995, when it was greater than 9 acres and supported almost 4 acres of vegetated habitat. The island was also included as a beneficial use component of a dredging project to improve the Channel to Smith Point in 2002. A breakwater was constructed adjacent to the island between 2003 and 2004 that has provided some protection by reducing erosion. The existing breakwater will be incorporated into the design of the restored island.

In 2013, the island was approximately 4 acres in size and supported approximately 0.6 acres of vegetation. Historically, 21 species of colonial waterbirds have used the island for nesting. At its peak, several thousand nesting pairs used the island each year. In 2012, the island supported only three species totaling about 30 pairs. The island is currently composed of shell and shell hash that was left behind after the lighter dredged sediments eroded away with little surface soils present. Harsh environmental conditions have limited the presence of vegetation to only a few salt cedar (*Tamarix* sp.) and limited herbaceous vegetation including sea purslane and seaside tansy which can tolerate the salinity exposure (Hackney pers. comm. 2014). The island supports limited colonial waterbird nesting and little species diversity due to changes in vegetation and habitat loss from erosion. The proposed design for the restoration and protection of Smith Point Island will take into consideration methods to protect to the island from future land loss associated with erosion and relative sea level rise. Restoration and protection will also restore the island's size and elevation such that it will provide sufficient area and height to support colonial nesting birds.

After construction is completed, the island footprint will be approximately 6 acres. Temporary levees may be constructed to contain fill material. The restored island will be protected by approximately 250 feet of new breakwater and 2,000 feet of existing breakwater around three sides of its perimeter. The southern portion (2 acres) of the existing island will be improved by raising the elevation with shell material to build an emergent shell beach. About 3 acres of the island will be planted with native scrub-shrub vegetation. The conceptual drawing is shown in Figure 5-5.

Figure 5-5. Conceptual drawing of the proposed Smith Point Island restoration, illustrating the footprint of the breakwater, fill, and emergent shell substrate



The surface of Smith Point Island is currently covered with a layer of winnowed oyster shell (fossil) approximately 1 to 2 feet thick. The shell is constantly moved by wave energy which inhibits the accumulation of soil or fine shell material capable of supporting vegetation. As a result, the material provides an ideal nesting location for bare ground nesting birds. Despite this ideal nesting substrate, its elevation is currently so low that nesting birds experience nest failure with high tide events. To maintain island habitat for ground-nesting birds, material consistent in structure and composition to the island's existing shell hash will be placed on about 2 acres of the current island to increase its elevation. This shell beach will have an elevation that will support ground nesting species of colonial waterbirds. It will also provide a small wave break on the channel side of island. This shell beach and its associated intertidal shell material will protect the island on its southern side from wave induced erosion. The shell

material used will be similar to the shell hash present in structure, form, and mineral composition (calcareous).

5.1.2.2 East Matagorda Bay Rookery Island

East Matagorda Bay contains a number of small islands and one large island that supports colonial waterbirds. The larger island, Dressing Point Island, is part of the Big Boggy National Wildlife Refuge. It supports a diverse and abundant suite of colonial waterbirds. The only other islands that are similar are 40 miles to the west at Chester's (Sundown) Island and 40 miles to the east at West Bay Bird Islands (Old and New). Significant foraging habitat lies within the adjacent areas to support colonial waterbirds.

Restoration and protection of Dressing Point Rookery Island in East Matagorda Bay supports the needs or goals of multiple conservation plans. These plans include but are not limited to the following national, state and regional planning documents:

- Waterbird Conservation for the Americas: The North American Waterbird Conservation Plan, Version 1 (Kushlan et. al. 2002);
- Southeast United States Regional Waterbird Conservation Plan (USFWS and North Carolina Audubon Society 2006);
- Strategic Plan: The Coastal Program Stewardship of Fish and Wildlife Through Voluntary Conservation Regional Step-Down Plan Region 2 (Texas) Part 2 of 3 FY 2006-2010 (USFWS 2006);
- Gulf Coast Joint Venture Conservation Planning for Reddish Egret (Vermillion and Wilson 2009);
- Texas Conservation Action Plan 2012 – 2016: Gulf Coast Prairies and Marshes Handbook (TPWD 2012);
- Texas Mid-Coast Initiative Area Fact Sheet (Gulf Coast Joint Venture 2012);
- Comprehensive Conservation Plan and Environmental Assessment – Texas Mid-Coast National Wildlife Refuge Complex (USFWS 2013b); and
- Reddish Egret Conservation Action Plan (Wilson et. al. 2014).

The information provided in each of the planning documents listed above may be for a specific species or may target a group or guild of waterbirds. Actions or recommendations in each may be directly related to the restoration of Dressing Point Island; typical nesting islands, or they may emphasize the need of a species that will benefit from the East Matagorda Bay rookery island.

5.1.2.2.1 Dressing Point Island

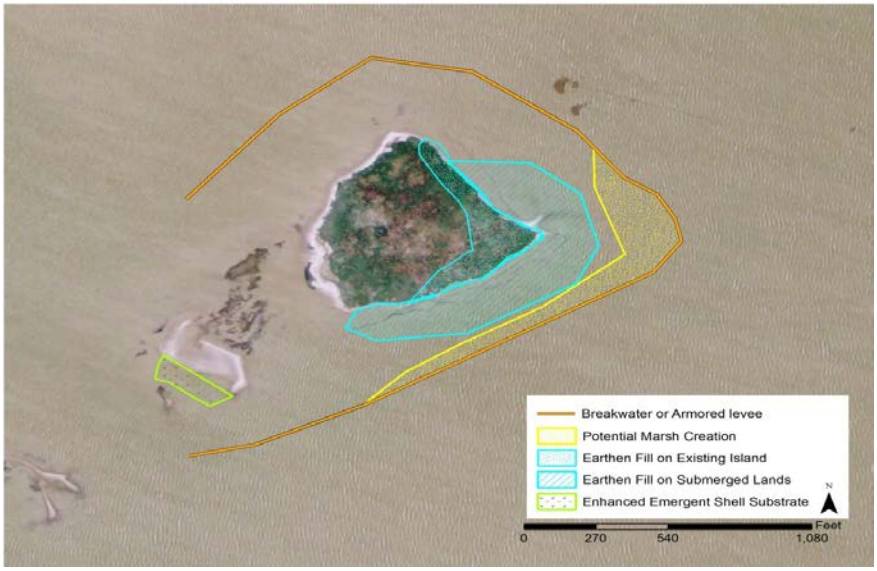
Dressing Point Island is a natural island located in East Matagorda Bay and is part of the Big Boggy National Wildlife Refuge. Dressing Point Island currently includes 7 acres of vegetated island and intertidal shell beach as well as shell hash berms along parts of its shoreline. Erosion and subsidence have decreased the area of the island from about 13 acres in 1984 to about 7 acres in 2011. The design for the restoration and protection of Dressing Point Island will take into consideration methods to protect the island from future land loss associated with erosion and relative sea level rise. Waterbird

use of the island has declined as its size has decreased. During the early 1970s to late 1980s the mean number of nesting pairs was about 10,000 pairs. Between the early 1990s and the present, the number of nesting pairs has declined to an average of about 5,000 pairs. Despite these declines, Dressing Point Island is currently an important colonial rookery island on the upper coast of Texas. The island supports nesting of brown pelicans, wading birds, laughing gulls and terns.

A shell knoll adjacent to the island has some scattered winnowed oyster shell (fossil). These areas have been surveyed, identified and mapped. The shell is constantly moved by wave energy which prevents the accumulation of soil or fine shell material capable of supporting vegetation. As a result the material provides an ideal nesting location for bare ground nesting birds. Despite this ideal nesting substrate, its elevation is currently so low that nesting birds can experience nest failure with high tide events. To enhance the existing shell knoll, material consistent in structure and composition will be placed southwest of the island to increase the elevation.

After construction is completed, the island footprint will be approximately 12 acres, which includes about 5 acres of existing island that will be avoided during construction. Fill will be placed on 2 acres of existing island and on 5 acres on submerged lands between the constructed breakwater and existing island. Temporary berms will be constructed, if needed, to contain fill material. The restored island will be protected by approximately 5,000 feet of breakwater. About 7 acres of the restoration area will be planted with native scrub-shrub vegetation. Approximately 2,500 cubic yards of shell material will be placed and integrated with the existing shell knoll (emergent shell substrate) southwest of the island. This added material will raise the elevation to support ground nesting species of colonial waterbirds. It will also provide a small wave break and protect a portion of the island from wave induced erosion. The conceptual drawing is shown in Figure 5-6.

Figure 5-6. Conceptual drawing of the proposed Dressing Point Island restoration, illustrating the footprint of the breakwater/levee, fill, and emergent shell substrate



A potential component of the restoration and protection of Dressing Point Island includes a constructed marsh located adjacent to the breakwater. Should dredging be required to provide access for vessels during construction, the project design will allow for the beneficial use of the dredge material, using best management practices (BMPs), to backfill the channel and use any excess material to create intertidal marsh. The decision to construct the marsh will be made by the Implementing Trustees[1] for the Texas Rookery Islands project and only after it has been determined that there are enough remaining funds available from the funding provided for the Texas Rookery Islands project.

5.1.3 Evaluation Criteria

The Texas Rookery Islands project falls within the project type "Restore and Protect Birds," which was evaluated under the Preferred Alternative in the Final Phase III ERP/PEIS, and meets the evaluation criteria established by OPA and the Framework Agreement. The intent of the project is to increase the size of available rookery island habitat in order to increase the number of nesting colonial waterbirds. The project has a clear nexus to the Spill (See 15 C.F.R. § 990.54(a)(2) and Sections 6a-6c of the Framework Agreement). The Spill injured avian resources throughout the northern Gulf through a variety of mechanisms, including but not limited to exposure to oil, disturbance from response activities,

[1] U.S. Department of the Interior and the Texas Trustees (Texas Commission on Environmental Quality, Texas General Land Office, and Texas Parks and Wildlife Department).

cleaning in rehabilitation facilities, and degradation of habitat. Numerous dead and oiled brown pelicans, terns, wading birds and gulls were collected during and following the Spill. The project will stabilize and protect rookery island shorelines, restore land mass and elevations, and restore vegetation. The enhancements of the islands will increase the amount and longevity of bird nesting habitat, by providing nesting habitat which will otherwise not exist into the future.

The project is technically feasible, utilizes proven techniques with established methods and documented results, and can be implemented with minimal delay. Government agencies have successfully implemented similar projects in the region. For these reasons, the Project has a high likelihood of success (See 15 C.F.R. § 990.54(a)(3) and Section 6e of the Framework Agreement).

Potential environmental effects are analyzed under applicable environmental regulations in Section 5.2. That analysis indicates that adverse effects from the project will largely be minor, localized, and often of short duration. In addition, any BMPs and measures to avoid and minimize impacts that are identified during the permitting process or during consultations and reviews with natural resource agencies will be implemented. As a result, collateral injury will be avoided and minimized during project implementation (construction, operations, and maintenance) (15 C.F.R. § 990.54(a)(4)).

Project cost estimates are based on similar past projects, and demonstrate that the project can be conducted at a reasonable cost (See 15 C.F.R. § 990.54(a)(1) and Section 6e of the Framework Agreement). These past colonial waterbird projects include Evia Island, North Deer Island, New West Bay Bird Island, Dickinson Bay Island I, St. Mary's Island, and Shamrock Island. Other past projects using similar construction techniques for different conservation goals include Jumbile Cove, Delehide Cove, Starvation Cove and Bird Island Cove. These projects included the participation of restoration experts from federal, state, business, and non-profit entities, as well as the services of professional coastal engineers. The required coastal construction methods were similar to those included in this proposed early restoration project. When proposed, all of the past projects referenced were reviewed by the public and met all environmental conditions and requirements. As a result, the Texas Rookery Islands project is considered feasible and cost effective (See 15 C.F.R. § 990.54(a)(1) and (3)).

5.1.4 Performance Criteria and Monitoring

The performance of the project will be assessed using both qualitative and quantitative performance criteria related to the project objectives. The need for corrective actions and/or adaptive management will be determined by evaluation of the project over time using the specified performance criteria. Successful implementation of this project will be determined by the presence and numbers of targeted species of colonial nesting birds (e.g., brown pelicans, terns, wading birds and gulls) within the

restored/enhanced rookery islands. A full monitoring plan for the project is found in Appendix B (Texas Rookery Islands Project Monitoring Plan).[2]

Monitoring will occur for 5 years following completion of the restoration actions. Updates and additional details concerning the monitoring activities (i.e. the status of the construction activities, status of vegetation plantings, and/or number of nesting pairs) for this project will be summarized in annual summary reports.

5.1.5 Offsets

For purposes of negotiating Offsets with BP in accordance with the Framework Agreement, the Trustees used a Resource Equivalency Analysis to estimate bird Offsets. Bird Offsets (expressed in Discounted Bird Years)[3] were estimated for the islands by calculating additional brown pelican, gull, tern, and wading bird production expected over time compared to a no-action scenario. The Trustees and BP agreed that if this restoration is selected for implementation, BP will receive the following Offsets:

- For brown pelicans, NRD Offsets are 6,743 Discounted Bird Years in the Gulf of Mexico. These Offsets are only applicable to brown pelican injuries in the Gulf States and in the Gulf of Mexico, as determined by the Trustees' total assessment of injury for the Oil Spill.
- For gulls, NRD Offsets are 87,904 Discounted Bird Years in the Gulf of Mexico. These Offsets are only applicable to gull injuries in the Gulf States and in the Gulf of Mexico, as determined by the Trustees' total assessment of injury for the Oil Spill.
- For terns, NRD Offsets are 27,447 Discounted Bird Years in the Gulf of Mexico. These Offsets are only applicable to sandwich and royal tern injuries in the Gulf States and in the Gulf of Mexico, as determined by the Trustees' total assessment of injury for the Oil Spill.
- For wading birds, NRD Offsets are 11,128 Discounted Bird Years in the Gulf of Mexico. These Offsets are only applicable to great blue heron, roseate spoonbill, reddish egret, great egret, snowy egret, tricolored heron, and black-crowned night heron injuries in the Gulf States and in the Gulf of Mexico, as determined by the Trustees' total assessment of injury for the Oil Spill.

The "Discounted Bird Years" calculation uses a discounting rate to convert the number of bird years to a common base year. Offsets were estimated for brown pelicans, gulls, terns, and wading birds as articulated above because these species, in particular, are expected to benefit from the restoration actions. Factors used to develop bird Offsets included site-specific estimates of nesting density, typical number of fledglings per nest, expected longevity of the project, tropical storm frequency, the percent

[2] BP and the Trustees agreed to work together to develop the monitoring plans for this project. The monitoring plan included in Appendix B has been updated and is the final plan developed with BP.

[3] Discounted Bird Years are expressed in present value 2010 discounted bird years.

of each island area used for nesting, and the time for vegetation to become established. These Offsets would, in the future, be credited against the Trustees' final assessment of total injury to these bird species resulting from the Spill.

5.1.6 Estimated Cost

The total estimated cost to implement this Project is $20,603,770. This cost reflects current cost estimates developed from the most current designs for each island available to the Trustees at the time of the project negotiation. The estimated cost includes provisions for planning, engineering and design, construction, monitoring, and contingencies.

5.2 Texas Rookery Islands Project: Environmental Assessment

The Texas Rookery Islands project would restore and protect three rookery islands in Galveston Bay and one rookery island in East Matagorda Bay using coastal engineering techniques (Figure 5-1). Restoration actions at each proposed rookery island would increase the amount of available nesting habitat by expanding the size of the island and enhancing the quality of habitat for nesting birds. Habitat longevity would be increased by raising the island elevation and constructing protective features, such as breakwaters or armoring levees.

5.2.1 Introduction and Background, Purpose and Need

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the programmatic portions of the Final Phase III ERP/PEIS. This EA qualifies for tiering from the Final Phase III ERP/PEIS in accordance with U.S. Department of the Interior regulations (43 C.F.R. §46.140, Using tiered documents) under "b" and "c". This project is consistent with the project type, "Restore and Protect Birds," which was included in the Preferred Alternative "Contribute to Restoring Habitats and Living Coastal and Marine Resources and Recreational Opportunities." By tiering, this EA provides the requisite additional detail for a project-level NEPA analysis that considers potential site specific impacts anticipated from implementation of the proposed action and the no action alternative. See Chapter 1.3 for information on the Final Phase III ERP/PEIS and tiering of the Phase IV proposed projects.

The Texas Rookery Islands project is consistent with the Final Phase III ERP/PEIS' Preferred Alternative as described in the October 2014 ROD~~2014 Record of Decision (79 FR 64831-64832; October 31, 2014~~) and the Trustees find that the conditions and environmental effects described in the broader Phase III ERP/PEIS (with updates as described in Chapter 2 of this document) are still valid. Specifically, the EA for the proposed Texas Rookery Islands project tiers from the analyses found in the following sections of the PEIS:

- Chapter 5: Proposed Early Restoration Programmatic Plan: Development and Evaluation of Alternatives: Descriptions of Alternatives 2 (Section 5.5.3 Contribute to Restoring Habitats and Living Coastal and Marine Resources), including Section 5.3.3.8 Restore and Protect Birds, and 4 (Section 5.3.7 Preferred Alternative: Contribute to Restoring Habitats, Living Coastal and Marine Resources and Recreational Opportunities);
- Chapter 6: Environmental Consequences, Section 6.3.8, Project Type 8: Restore and Protect Birds, and 6.4, Alternatives 2 (and 4): Human Uses and Socioeconomics.
- Chapter 6.8: Potential Cumulative Impacts

This EA incorporates by reference the analysis found in those sections of the Final Phase III ERP/PEIS. This EA also incorporates by reference all introductory, process, background, and Affected Environment information and discussion related to Early Restoration provided in the Final Phase III ERP/PEIS (Chapters 1 through 6).

The proposed Texas Rookery Islands project is analyzed and described in subsequent sections as one EA comprised of two sections. Subsections within island descriptions are, in many cases, very similar in regards to the potential impact to physical, biological, and socioeconomic resources. These similarities make it possible to analyze the four islands of the proposed project in two sections based on geography. Each section includes detailed discussion of resources potentially involved with the proposed project. The two sections of the proposed project EA are 1) the Galveston Bay rookery islands and 2) the East Matagorda Bay rookery island.

5.2.1.1 Background

The Spill injured avian resources throughout the northern Gulf through a variety of mechanisms, including but not limited to exposure to oil, disturbance from response activities, cleaning in rehabilitation facilities, and degradation of habitat. Numerous dead and oiled brown pelicans, terns, wading birds and gulls were collected during and following the Spill. This project would stabilize and protect rookery island shorelines, restore land mass and elevations, and restore vegetation. These enhancements of the islands would increase longevity of the islands and increase the amount of waterbird nesting habitat.

Preliminary engineering has been completed for the Dickinson Bay II and Dressing Point Islands. The plans developed for Smith Point and Rollover Bay islands are currently conceptual in design. Refined design and construction specification packages for each of the islands would be developed by PE(s) with coastal restoration experience. Table 5- 1 (Section 5.1.2) summarizes the preliminary construction tasks based on current planning efforts for each island.

5.2.1.2 Purpose and Need

The proposed action falls within the scope of the programmatic purpose and need for early restoration as described in the Final Phase III ERP/PEIS because it would accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. The proposed project's purpose is to begin to restore and protect birds injured as a result of the Spill. The project is needed to restore colonial waterbird nesting habitat in Galveston and East Matagorda Bays. Restoration actions at each rookery island would increase the amount of available nesting habitat by expanding the size of the island and enhancing the quality of habitat for nesting birds. Habitat longevity would be increased by raising the island elevation and constructing protective features, such as breakwaters or armoring levees. Increasing the amount of available nesting habitat, enhancing the quality of habitat, and increasing the protection of the habitat from erosion and sea level rise would result in an increase in the numbers of nesting colonial waterbirds.

5.2.2 Scope of the Environmental Assessment

This project is proposed as part of Phase IV of the Early Restoration program. The broader environmental analyses of these types of actions as a whole are discussed in the Final Phase III ERP/PEIS from which this EA is tiered. The information and analyses in this document supplement the

programmatic analyses with site-specific information. This EA provides NEPA analysis for potential impacts for site-specific issues and concerns anticipated from implementation of the proposed actions and the no action alternative.

Under NEPA, federal agencies must consider the environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. This project is proposed under OPA and thus meets the level of federal agency involvement to require review. The following sections describe the affected resources and environmental consequences of the project.

In order to determine whether an action has the potential to result in significant impacts, the **context and intensity** of the action must be considered. **Context** refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). **Intensity** refers to the severity of impact and could include the timing of the action (e.g., more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse.

For purposes of this document, impacts are characterized as minor, moderate or major, and temporary or long-term. The analysis of beneficial impacts focuses on the duration (short- or long-term), without attempting to specify the intensity of the benefit. The definition of these characterizations is consistent with that used in the Final Phase III ERP/PEIS, and can be found in Appendix D. As discussed above, the EA for the Texas Rookery Islands project is split into two geographic areas: the islands in Galveston Bay and the island in East Matagorda Bay. Section 5.2.4 addresses the Galveston Bay rookery islands, which include Dickinson Bay Island II, Rollover Bay Island, and Smith Point Island. Section 5.2.5 addresses the rookery island in East Matagorda Bay, Dressing Point Island.

5.2.3 Project Alternatives

Both OPA and NEPA require consideration of the No Action alternative. For this section, there are two alternatives, No Action and the Proposed Actions of the Texas Rookery Island project.

5.2.3.1 No Action

For this Phase IV proposed project, the No Action alternative assumes that the Trustees would not pursue the actions comprising the Texas Rookery Islands project as part of Phase IV Early Restoration.

Under No Action, the existing conditions described for the bird rookery islands resources in the affected environment subsections would prevail. Restoration benefits associated with this project would not be achieved at this time.

Section 1502.14(d) of the CEQ Regulations requires the alternatives analysis to "include the alternative of no action." CEQ states that in some cases "no action" is "no change" from current management direction or level of management intensity. Therefore, the "no action" alternative may be thought of in

terms of continuing with the present course of action until that action is changed. Projected impacts of proposed actions would be compared to those impacts projected for the existing actions. In this case, the existing rookery islands would continue to diminish and nesting habitat for colonial waterbirds would continue to degrade. Therefore, the No Action alternative would result in fewer pairs of nesting colonial waterbirds on Texas rookery islands.

5.2.3.2 Proposed Actions

The Proposed Actions would implement the restoration and protection of all four Texas Rookery Islands:

- Dickinson Bay Island II,
- Rollover Bay Island,
- Smith Point Island, and
- Dressing Point Island.

5.2.3.3 Other Alternatives Considered but Not Analyzed

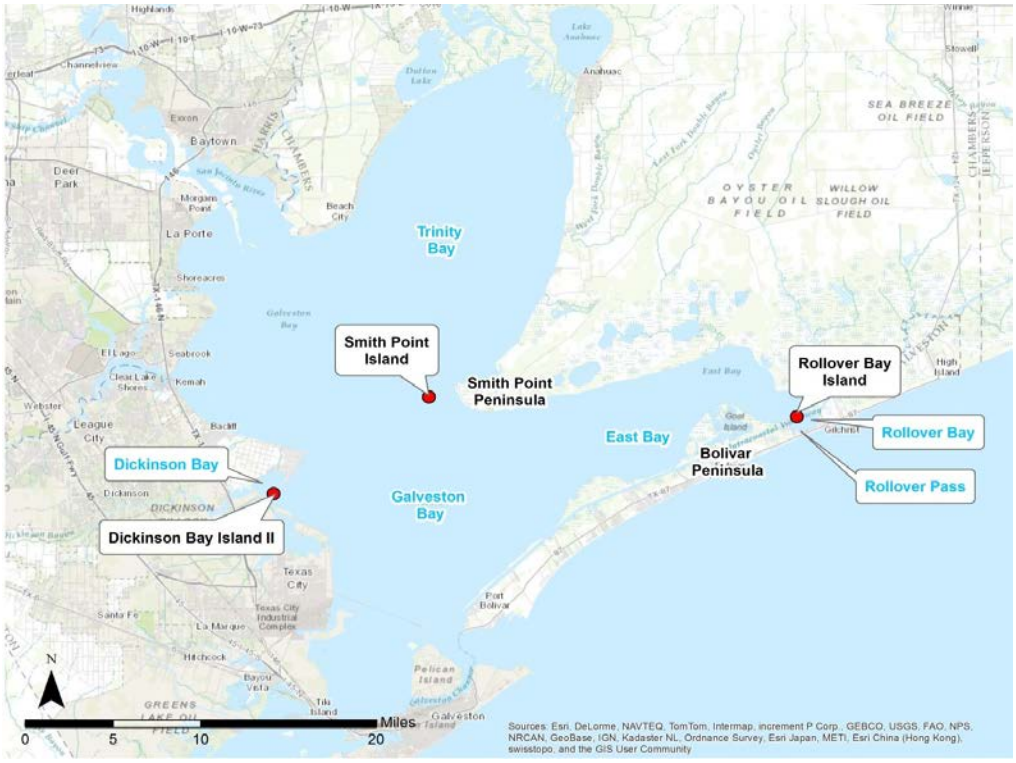
The Trustees' Early Restoration project selection process is described in Section 2.1 of the Final Phase III ERP/PEIS. As described there, potential projects evolve from public scoping, ongoing public input through internet-accessible databases, review of current federal and state management plans and programs, and Trustee expertise and experience. From this broad list of project ideas, the Trustee's Early Restoration project selection process initially results in a set of proposed projects that, consistent with the Framework Agreement, were submitted to BP for review and consideration. One area considered for Early Restoration included restoration for injured birds.

The Trustees considered a range of techniques for the restoration of birds. To be consistent with the Final Phase III ERP/PEIS, the Trustees focused on restoration techniques identified for the project type "Restore and Protect Birds". To evaluate each of the available restoration techniques, the Trustees considered the magnitude of the benefits that would be provided by the restoration, the cost-effectiveness of the techniques, and the overall likelihood that the Trustees would be able to successfully implement the effort as 'early restoration.' Secondary considerations included administrative efficiency, availability of existing partnerships, and strength of local support. The Trustees are pursuing the creation/enhancement of bird nesting and/or foraging habitat through the Texas Rookery Islands project, because the project is feasible at this time given the constraints of the Framework Agreement.

5.2.4 Galveston Bay Rookery Islands

This section provides the background and description for the proposed actions in Galveston Bay, which includes the restoration and protection of Dickinson Bay Island II, Rollover Bay Island, and Smith Point Island (Figure 5-7). The location, scope, construction and installation, as well as operations and maintenance for these three islands are discussed in the following subsections.

Figure 5-7. Location of Galveston Bay Rookery Islands



5.2.4.1 Galveston Bay Rookery Island Locations

Galveston Bay is composed of many interconnected bays, including Trinity Bay, Galveston Bay, East Bay, West Bay, and Christmas Bay. These bays are bordered by four counties (Brazoria, Chambers, Galveston, and Harris) and are partially separated from the Gulf of Mexico by two prominent coastal barriers, the Bolivar Peninsula and Galveston Island.

5.2.4.1.1 Dickinson Bay Island II

Dickinson Bay Island II is under half of a mile from the mainland and is located at the mouth of Dickinson Bay in Galveston Bay, Galveston County, Texas. Specifically it is located in Dickinson Bay near 29.464394˚ N, 94.936601˚ W; NAD83. There are two locations currently proposed to replace a lost rookery island (Figure 5-2). Dickinson Bay Island II may be constructed in either a northern location or a southern location. The area that may be directly or indirectly affected is about 15 acres and includes the

footprint of the construction and staging areas around the island, breakwater, armored levee, or other structure, vegetation plantings, and earthen fill. The borrow area is not included in this footprint estimate because it has not yet been identified. A navigation channel, approximately 7 feet deep is located between the two potential project sites. Areas not within the navigation channel are approximately 4 feet deep. The nearby boat dock at April Fool Point, which is approximately 1 mile away, may be used to load and transport materials. The Texas General Land Office (TGLO) has identified places to access coastal waterways at http://txcoasts.com/. Information specific to Galveston County access points and available activities is located at http://txcoasts.com/.

5.2.4.1.2 Rollover Bay Island

Rollover Bay Island is situated within the Galveston Bay system, Galveston County, Texas. Specifically it is located in Rollover Bay which lies in East (Galveston) Bay at 29.521548˚ N, 94.505693˚ W; NAD83. The area that may be directly or indirectly affected is about 25 acres and includes the footprint of the construction and staging areas around the island, breakwater, armored levee, or other structure, vegetation plantings, and earthen fill. The borrow area is not included in this footprint estimate because it has not yet been identified. The island is near the GIWW which has depth of about 10 feet. The surrounding area is around 4 feet deep. The nearby boat dock at Dr. Lloyd K. Lauderdale Public Boat Ramp, which is about a half mile away, may be used to load and transport materials with small motorboats. Large equipment and materials moved by barges or other vessels would use the established interconnected waterways and larger commercial docking facilities. TGLO has identified places to access to coastal waterways at http://txcoasts.com/. Information specific to Galveston County access points and available activities is located at http://txcoasts.com/

5.2.4.1.3 Smith Point Island

Smith Point Island lies approximately 1.25 miles southwest of the Smith Point peninsula and is approximately 1.4 miles from the James Robbins Park boat ramp on the peninsula. The island is located between Trinity Bay and East Bay within Galveston Bay near 29.5363˚ N, 94.8087˚ W; NAD83. The area that may be directly or indirectly affected is about 28 acres and includes the footprint of the construction and staging areas around the island, breakwater, armored levee, or other structure, vegetation plantings, earthen fill, and emergent shell substrate. The borrow area is not included in this footprint estimate because it has not yet been identified. The depths near the island are relatively shallow ranging to a depth of approximately 3 feet in the surrounding area and up to 5 feet in the adjacent navigation channel. The nearest dock to the project site is located on Smith Point peninsula and may be used to load material for transport to the project area. The site can be accessed using the Channel to Smith Point which connects Smith Point to the Houston Ship Channel (National Oceanic and Atmospheric Administration [NOAA] navigational charts for Galveston/Houston: http://xpda.com/nauticalcharts/).

5.2.4.2 Galveston Bay Rookery Islands Project Scope

The general conceptual approach and design for the restoration and protection of the rookery islands would use coastal engineering techniques to expand the area of the island, raise its elevation, plant native species of vegetation, and protect the island from erosion. Specifics for each island are provided below.

5.2.4.2.1 Dickinson Bay Island II

The proposed island locations are on submerged bay bottom that is owned by the State of Texas. Appropriate lease(s) or modifications to existing leases would be obtained prior to implementing the proposed restoration actions. The navigation channel would be utilized to transport supplies to the project area. The design currently under consideration for Dickinson Bay Island II would include the construction of an island at a height protective of high tide events during the nesting season. The island is currently in the preliminary engineering design stage (HDR 2014). One of two potential sites would be chosen for construction of Dickinson Bay Island II (Figure 5 -2).The following description for each of the construction elements is based on engineering and biological considerations. The preliminary plan contains the following elements:

- Construct 4 island acres by placing clean fill over submerged land;
- Construct 2,000 feet of armored levees to protect the restored island;
- Build 0.8 acres of submerged levee; and
- Plant 3.5 island acres with native scrub-shrub vegetation.

5.2.4.2.2 Rollover Bay Island

The proposed island restoration is located on submerged and emergent land that is owned by the State of Texas. Appropriate lease(s) or modifications to existing leases would be obtained prior to implementing the proposed restoration actions. The GIWW navigation channel would be utilized to transport supplies to the project area. The conceptual design for the restoration and protection of Rollover Bay Island includes several components that would improve nesting habitat on the island and increase its longevity. The conceptual plan is shown in Figure 5-4 and contains the following elements:

- Construct 10 island acres by placing clean fill over submerged land or existing land (if present);
- Construct 4,500 feet of armored levees to protect the restored island; and
- Plant 4 island acres with native scrub-shrub vegetation.

Restoration and protection of Rollover Bay Island requires the placement of material on the submerged bay bottom, which may impact hard shell substrate, a valued benthic substrate in Galveston Bay. Any

impacts incurred after avoidance and minimization measures are taken would be fully mitigated by restoring an equal or greater amount of hard substrate.

5.2.4.2.3 Smith Point Island

The proposed island restoration is partially located on submerged and emergent land. Appropriate lease(s) or modifications to existing leases would be obtained prior to implementing the proposed restoration. Previous restoration activities by the USACE in 2002 near the area of Smith Point Island created infrastructure which can be used to facilitate the restoration of the island. There is an existing breakwater in the project area. This feature would be incorporated into the design of the restored island. The conceptual design for the restoration and protection of the island includes several components that would improve nesting habitat on the island and increase its longevity. The conceptual plan is shown in Figure 5- 5 and contains the following elements:

- Construct 6 island acres by placing clean fill over submerged land;
- Enhance 2,000 feet of existing breakwater to protect the restored and existing island;
- Construct 250 feet of new breakwater to protect the restored and existing island;
- Raise the elevation on 2 acres within the footprint of the existing island with shell material to build an emergent shell beach; and
- Plant 3 island acres with native scrub-shrub vegetation.

5.2.4.3 Galveston Bay Rookery Islands Construction and Installation

Preliminary engineering has been completed for Dickinson Bay Island. The plans developed for Smith Point and Rollover Bay islands are currently conceptual in their design. Refined design and construction specification packages for each of the islands would be developed by PE(s) with coastal restoration experience. Construction and implementation strategies would be similar for each rookery island. Throughout the design process, every practical attempt would be made to avoid and minimize potentially adverse environmental and cultural resource impacts. The following descriptions for each of the island construction elements are preliminary and based on current planning efforts and resource agency experience with similar projects within Galveston Bay and should be considered typical.

Construction may require temporary channels to access the restoration and borrow sites. The need for temporary channels will be determined during the engineering and design stage for each island. All temporary channels would be backfilled upon completion of construction work. Fill material would be sourced from either beneficial use of dredged material (likely from a navigation channel project), direct dredging from a nearby *in situ* borrow site, an existing dredged material placement area, or from an upland borrow site. The direct dredge borrow source areas would be no more than 5 feet below grade. All sources of borrow material would be assessed for suitability from an engineering perspective and would be evaluated for environmental conditions to ensure there are no significant impacts to cultural and sensitive resources. The target elevation for the restored island would place the crown at least 4 feet above mean tide level post-settlement sloping to existing grades. Temporary berms would be

created, if needed, to contain any dredged material. Higher elevations of each island would be planted with native scrub-shrub vegetation. Plants used would consist of species found at similar island sites and would be propagated from stock from the upper Texas coast. Breakwaters or armored levees will be used to protect the islands from erosional forces and may be enhanced to provide containment of fill material based on engineering considerations.

Methods and tools would be approved by the PE and the project team that includes Trustee representatives prior to implementation. Environmental considerations, BMPs, and legal and permit requirements must be met regardless of methods and tools chosen. These would be outlined in the bid specification package developed by the PE and contracting officers. This specification package would ensure that the contractor is made aware of not only the engineering specifications but the additional obligations they would incur associated with federal and state laws governing the activities associated with the project. It would also provide the project related approvals needed by the project manager and the PE to conduct the project.

In general, construction would require the use of barges, small watercraft, large track hoe excavators, earth moving equipment, hydraulic or clamshell dredges, and a dockside staging area. Equipment and materials for the construction activities would be transported via roads and marine waterways. Large equipment and materials moved by barges would use the established interconnected waterways. This may include the GIWW, the Houston Ship Channel and/or other navigation channels (NOAA navigational charts for Galveston/Houston: http://xpda.com/nauticalcharts/). The TGLO has identified places to access to coastal waterways at http://www.glo.texas.gov/texas-beach-access/beach_bay.html. Information specific to Galveston County is located at http://www.glo.texas.gov/texas-beach-access/pdf/beach-bay/Galveston.pdf.

5.2.4.3.1 Island Fill and Borrow Site

Uncontaminated earthen fill material would be used to raise elevations. Fill material would be sourced from a nearby navigation channel, a nearby *in situ* borrow site, an existing dredged material placement area, or from an upland borrow site depending on availability of material, its engineering properties, and distance. Additionally, borrow sites would be evaluated for environmental conditions to ensure that any cultural and/or sensitive resources are avoided or properly addressed. The location would be based on several factors including the absence of sensitive resources (e.g. oyster reef, seagrasses), geotechnical and sediment quality, nearby commercial and/or recreational activities, and lateral extent of available material (avoiding a deep borrow site). The site would have an optimal footprint in order to keep the depth modified by the removal of material as shallow as possible, which would prevent impacts to water quality, scouring, or the development of deep pockets in a naturally shallow bay system. Ideally, the borrow site would be situated in the bay to receive sediments carried by currents so it can be replenished with sediments quickly, increasing the rate of recovery to the level of the adjacent bay bottom.

For any of these borrow sites, the material would be mixed with some *in-situ* water as it is placed, requiring a settlement period and the controlled discharge of decant water from within the restoration area. The height of any temporary or permanent structure and construction methods required to contain the earthen fill would be determined by the type of material used and its estimated water content. Location of the structures would ensure containment and settlement of the fill materials, using BMPs. The volume of earthen fill material for each island is listed below and is the maximum amount of material estimated to be needed:

- Dickinson Bay II – 76,000 cubic yards
- Rollover Bay – 80,000 cubic yards
- Smith Point – 70,000 cubic yards

Material from a direct dredge source area would be mechanically excavated or hydraulically dredged. Excavators used may include a dragline or long-arm excavator to place material on barges for transport to the island site. Hydraulic dredge would be a cutter-head design because it does not pose a risk to pelagic aquatic organisms. If hydraulic dredging is used, the dredge pipe will avoid disturbance to sensitive resource areas such as oyster reefs and seagrass beds. The pipe would be routed to avoid laying on top of these resource areas and any equipment will avoid them as well. Any areas containing such resources in the construction and transport area of each project site will be visibly marked prior to start of construction. Material would be transported to the island via a hydraulic dredge pipeline or by barge if a mechanical dredge is used. Pipeline or hydraulic dredges, because they are not known to take sea turtles, will be used, if possible (NOAA 2007).

A form or method of beneficial use of dredged material is to mine existing USACE material placement areas that are associated with federally maintained navigation channels. These placement areas are maintained and operated as part of the GIWW federal project. Material would be mined using mechanical or hydraulic excavation techniques. Mechanically excavated material would be placed on barges and transported to the islands.

Screening for potential chemical contaminants will be conducted on a case-by-case basis. For sediments from federally-maintained navigation channels or associated dredged material placement areas, previously collected contaminant analysis and bio-assay data will be obtained from the USACE Galveston District - Operations Branch records. For bay bottom borrow sites, local and regional knowledge of historical industrial activities as well as regulatory documentation on past and existing facilities in the vicinity of potential sediment borrow sources will be used to determine the likelihood and type of contaminants that might be expected to be encountered during construction. Based upon this information, USACE and state and federal resource agency personnel will be consulted to determine the amount of sampling and the type of chemical analyses that may be needed.

All environmental reviews required for the placement of the material obtained as part of a beneficial use disposal process would be completed by the other project (e.g. a navigation improvement project). If an *in situ* borrow area is used, the borrow area would be located as near the island as feasible and

would use surface bay bottom sediments. If earthen fill material is obtained from a more distant borrow area such as upland site, the material would meet engineering requirements and the site would be reviewed and approved by resource agencies for cultural and sensitive resources including at-risk species, wetlands, contaminants, and cultural resources. To date, the source of the fill material has not been identified for any of the three Galveston Bay rookery islands.

Measures to control turbidity caused by construction activities, decant water, and sediment movement would be in place to ensure sensitive habitats are protected, water quality standards are met, and sensitive resources are not affected. These measures may include appropriate water control structures to decant water, as well as the installation of silt fences, hay bales, filter-fabric, and/or temporary levees to control sediments and avoid negative impacts associated with the fill placement. The nearby presence of oyster reefs, other hard structure reef resources, and seagrass beds near some islands would require the use of significant control measures during project implementation.

5.2.4.3.2 Breakwater/Armored Levee

Breakwaters or armored levees would be installed to protect the island from erosional forces. However, they could be modified or enhanced as part of this project to act as containment for the earthen fill. Graded stone, typically limestone, would be used to construct the breakwaters or armoring. The amount, grading, and size of rock used would be dependent on several factors determined in the final design. These include wave and current energy expected, as well as whether the breakwaters or armored levees would be used for containment and dewatering of sediments or only for erosion protection. Breakwaters and levees used for containment are typically higher in elevation and larger than those used solely for erosion protection. These considerations along with physical data from the site would be evaluated by a qualified coastal PE and the project team prior to selection of design. The project team would include individuals from TPWD, USFWS, and participating partners. The source of the material is expected to be from known and existing limestone quarries used for coastal construction projects across the western Gulf of Mexico meeting standards specified for the project.

5.2.4.3.3 Submerged Levee

Only Dickinson Bay Island II would have a submerged levee as part of its design. The submerged levee incorporated into the design serves to create a water/shore interface that would facilitate the use of the island by avian species. The calm water/shore interface is an important component used by nesting birds and their fledged young. The exact design specifications have yet to be determined by the project team. However, a cap of protective cultch or rock material would be deployed over the submerged levee to provide long-term protection. The submerged levee may be exposed during low tide events but its elevation would be within the normal intertidal range.

5.2.4.3.4 Vegetation Planting

Once the earthen fill has dewatered and sediments have settled, the higher elevation portions of the restored islands would be planted with native scrub-shrub vegetation to help promote desired

vegetation establishment. Each island site would have a targeted number of acres for vegetative plantings: Dickinson Bay Island II, 3.5 acres; Smith Point Island, 3 acres; and Rollover Bay Island, 4 acres. Plants used would be species documented from similar island sites and be propagated from stock located on the upper Texas coast. Species under consideration include, but are not limited to, those shown in Table 5-2. A Vegetation Planting Plan modified from and based on the Natural Resources Conservation Service (NRCS) Publication NRCS-TX-612 would be developed prior to implementation (NRCS 2013). This plan would provide specifications for the species of native vegetation to be used; acceptable source stock; planting densities and locations on the island for planting; survival targets and adaptive management strategies. Expected plant survival is approximately 60% at the end of the 5-year monitoring period. Protective measures may include trunk collars or wire exclusion cages to protect saplings from herbivory or trampling during the first few years after planting. Time of year as well as substrate salinity would determine the timing for planting. It is anticipated that this would take place approximately one year after construction, depending on environmental conditions.

Table 5-2. Examples of native scrub-shrub species proposed for transplanting

Common Name	Scientific Name
Colima	*Zanthoxylum fagara*
Bumelia	*Sideroxylon lanuginosa*
Prickly Pear Cactus	*Opuntia sp.*
Texas Swamp Privet	*Forestiera augustifolia*
Huisache	*Acacia farnesiana*
Jerusalem Thorn	*Parkinsonia aculeata*

5.2.4.3.5 Shell Beach Enhancement

Shell beach habitat on Smith Point Island would be enhanced to support ground nesting birds by placing material similar to the existing shell hash on top of the existing substrate. Approximately 5,000 cubic yards of material similar to the existing shell is anticipated to be deposited on Smith Point Island raising the elevation approximately 1.5 feet. The final elevation of the improved island would be such that it would be suitable for shell and bare ground nesting species. The wave energy would maintain a portion of the island free from vegetation and ideal for shell and bare ground nesting birds.

Rollover Bay Island was created through the placement of dredge material. Erosive forces have winnowed the lighter sediment and concentrated fossil mollusk shell and shell fragments leaving a surface layer of hard shell substrate. This shell material is not part of accreting reefs dominated by living eastern oysters and does not have commercial fisheries value; however, the shell reef is an important ecological habitat in Galveston Bay. Therefore any unavoidable impacts to hard shell substrate caused by the placement of material for the island restoration may require compensation after consultations with natural resource agencies.

Material placed onto Rollover Bay and Smith Point Islands would be added in a manner that it emulates shell berms observed in nearby areas. The source of this material would be similar to the shell hash present on these islands in structure, form, and mineral composition (calcareous) and be either from current shell sources, limestone, or a mixture of limestone and shell, or material similar in size shape, density, etc. This material would be obtained from commercially available sources.

5.2.4.3.6 Construction Schedule

Currently, Dickinson Bay Island II does not exist; therefore, there is no nesting habitat present and construction could occur anytime during the year. If it appears that birds will nest on Rollover Bay and Smith Point Islands, construction would avoid the nesting season, which is usually February 1 through August 15. However, some field activities that pose minimal disturbance to nesting birds may be acceptable during this time. Any such activities would be coordinated with state and federal agency biologists and with non-governmental organization (NGO) partners prior to initiation of field work. The final engineering and design for all the islands is estimated to be completed in 12 months for Dickinson Bay Island II and 18 months for Rollover Bay and Smith Point Islands. Activities associated with construction are not expected to take longer than 6 months for Dickinson Bay Island II and Smith Point Island and 12 months for Rollover Bay Island. The timing of contracting awards and weather conditions could impact the construction schedule. To prevent disturbance to nearby residential communities near Rollover and Smith Point, construction activities that produce significant noise or require precision, such as moving or placing rock, would be limited to daylight hours.

5.2.4.4 Galveston Bay Rookery Islands Operations and Maintenance

The Galveston Bay Foundation leases a previously restored island in Dickinson Bay from the TGLO. Audubon Texas manages Rollover Bay Island through a lease for the island and submerged lands with the TGLO and Smith Point Island through a lease for the island and submerged lands with the Chambers-Liberty Navigation District. Appropriate lease(s) or modifications to existing leases would be obtained prior to implementing the proposed restoration actions. Maintenance activities on Dickinson Bay Island II would likely be managed by the Galveston Bay Foundation or another stakeholder and maintenance at Smith Point and Rollover Bay Islands would likely be managed by Audubon Texas or another stakeholder. As members of the Texas Colonial Waterbird Society, they participate in the annual waterbird surveys and work collectively to support waterbird conservation.

As members of the project teams for the respective islands, both Galveston Bay Foundation and Audubon Texas would participate in project development and be cognizant of obligations related to long-term management. Activities on the islands by both organizations include monitoring, predator control, and educational signs to reduce disturbance.

5.2.5 Galveston Bay Rookery Islands Affected Environment and Environmental Consequences

This section provides the affected environment and environmental consequences for the proposed actions in Galveston Bay, which includes the restoration and protection of Dickinson Bay Island II, Rollover Bay Island, and Smith Point Island.

According to the CEQ Regulations for Implementing NEPA (§§ 1502.1 and 1502.2) agencies should "focus on significant environmental issues" and for other than significant issues there should be "only enough discussion to show why more study is not warranted." After preliminary investigation, some resource areas were determined to be either unaffected or minimally affected by the proposed action. These resources are not discussed in further detail below. Only those resource areas with potential, adverse impacts are discussed in detail below.

The programmatic analysis looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resource areas that are not expected to be adversely impacted are not evaluated further under given proposed actions. Resource areas that are not analyzed in detail are listed below with a brief rationale for non-inclusion:

- Socioeconomics/Environmental Justice: Short-term beneficial impacts to the local and regional economies would occur from increases in construction jobs and demand for workforce to support the restoration projects. These jobs would provide income, sales, and downstream economic activity in the region. Any non-local workers, brought in for a short period of time, would bring in additional spending as workers stay in local hotels and eat in local eating and drinking establishments. Project spending would include and contribute to support of the workforce needed to design, engineer, manage, and carry out the projects. Additionally, locally purchased (or rented) equipment and materials would also benefit regional economies. Commercial fishing (shrimp, crab and oyster fisheries) occur in Galveston Bay. Of particular concern are the oyster leases in the vicinity of Smith Point Island. Prior to construction and during the engineering and design, the Implementing Trustees would work with the commercial fisheries community to prevent impacts to adjacent submerged lands used to harvest oysters.

  The Trustees find that the rookery islands do not meet any of the criteria for determining that disproportionately high and adverse effects would likely fall on minority or low-income populations. In addition, the islands are uninhabited by humans and restoration of the islands would not be directly affecting any residents. Furthermore, there are no adverse effects to low income or minority populations anticipated from the proposed action.

- Infrastructure: There are no pipelines near Rollover Bay Island. Pipelines near Dickinson Bay Island II and Smith Point Island are not in the construction footprint and would be avoided during construction. The proposed action is anticipated to have no impact to infrastructure,

since new infrastructure would not be built and existing infrastructure in the area would be avoided.

- Land and Marine Management: The rookery islands include submerged bay bottom in their construction footprints. Appropriate leases or modifications to existing leases would be obtained prior to construction. Audubon Texas currently manages Rollover Bay Island for nesting colonial waterbirds through a lease with TGLO. Audubon Texas currently manages Smith Point Island for nesting colonial waterbirds through a lease with the Chambers-Liberty Navigation District. The proposed action is anticipated to have no impact to land and marine management, since projects would be consistent with the prevailing management, practices, plans, and direction governing the use of the areas where the island restoration would take place.

- Land and Marine Transportation: The proposed action is anticipated to have no impact to land and marine transportation. Shipping routes would need to be properly identified prior to the selection of borrow sites for dredge and fill material to prevent any impacts to marine transportation. Activities related to construction would require coordination with the users of the waterway. While the Dickinson Bay Navigation Channel, Channel to Smith Point, or GIWW would be used to transport equipment and materials, barges would be staged adjacent to the island site and not within the approved waterway. It is expected that activities would not interrupt the channel traffic to any significant degree. Most of the commercial traffic takes place on a routine schedule and construction activities would be timed to reduce any interference with commercial operators.

5.2.5.1 Physical Environment

Galveston Bay is about 30 miles long, 17 miles wide, 6 to 12 feet deep, and has a surface area of 600 square miles. Galveston Bay was formed during the end of the last glacial period when world sea levels rose in response to melting glaciers (Anderson 2007). Formerly a river valley during the Pleistocene, sediments accumulated in the valley as the sea rose and formed the bay during the Holocene. The Galveston Bay geologic substrates are comprised of clay and silt with some sand. Most of the sand component is delivered from the Gulf by tidal forces. The main sources of sediments entering the system include the Trinity and San Jacinto River systems and to a lesser degree the many small streams and bayous that enter the system. Significant subsidence has occurred as the result of the withdrawal of underground fluids. This has resulted in significant changes to the shorelines of the bay as well as islands formed naturally or by man. Most of the islands in the bay system were created during the construction of waterways by the side casting of dredged material along the newly created channel. The description of the physical environment of Galveston Bay is divided into geology and substrates, hydrology and water quality, air quality and greenhouse gas emissions, as well as noise characteristics of the area.

5.2.5.1.1 Geology and Substrates

Affected Resources

Dickinson Bay Island II

Dickinson Bay Island II would be built over submerged sediments in subtidal habitat. Sediment cores were taken and the substrate was analyzed. The substrate was defined as sandy lean clay with shell fragments or clayey sand with shell fragments. Detailed substrate profiles are in Appendix A of the Alternatives Analysis. A navigation channel, approximately 7 feet deep is located between the two potential project sites. Areas not within the navigation channel are approximately 4 feet deep.

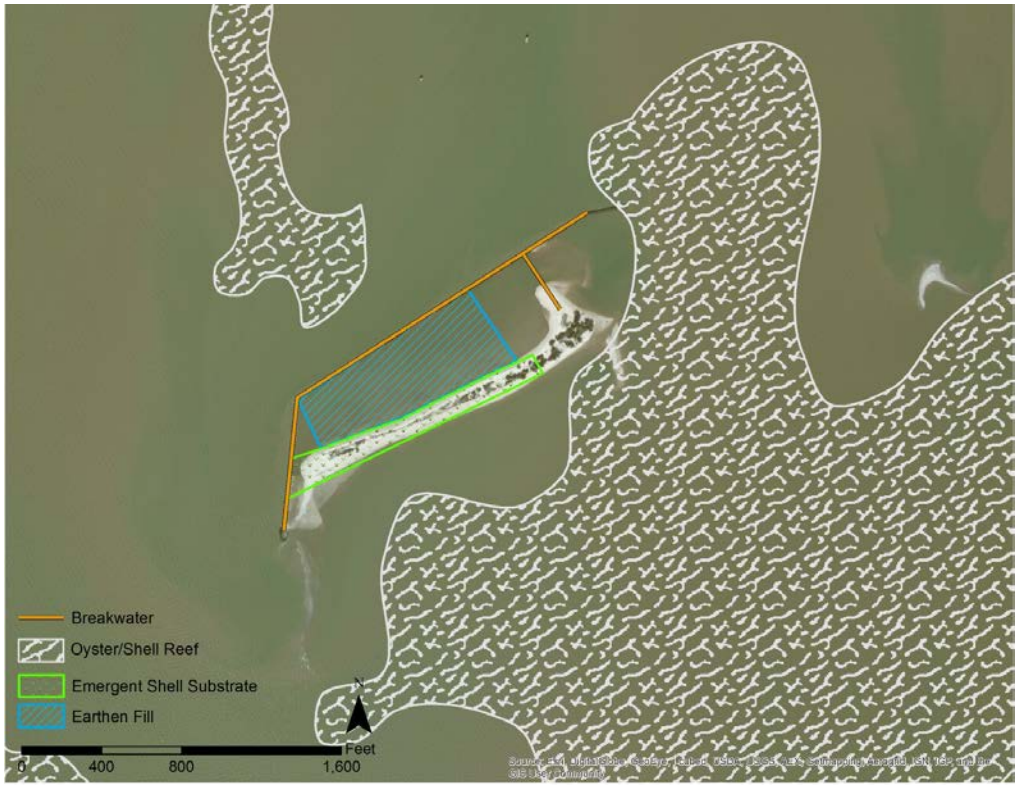
Rollover Bay Island

Several dredged material placement islands (approximately 11 islands) were created in Rollover Bay during excavation and maintenance of the GIWW. The site chosen for the restoration is associated with one of the five remaining islands. The material excavated was composed primarily of clays and silts with some sand containing fossil shell and shell fragments. The Galveston County Soil Survey identifies the island soils as Ijam Soil Series. These soils form in materials dredged from bays and waterways. The island is near the GIWW which has depth of about 10 feet. The surrounding area is around 4 feet deep.

Smith Point Island

Smith Point Island was likely a natural reef island associated with a suite of reef islands mapped in 1921 (NOAA 1921). In 1950, material was added to the islands current location when the Channel to Smith Point was constructed. The island may have received additional material in 1972. The island is currently comprised of winnowed oyster shell that was left behind after the lighter dredged sediments eroded away. The submerged bay bottom surrounding the island is primarily composed of clays with some silt. The area contains considerable active oyster reef, oyster leases, and hard bottom substrate (Figure 5-8)). The depths surrounding the island are relatively shallow from approximately 3 feet to 5 feet in the nearby navigation channel.

Figure 5-8. Location of oyster reefs in the vicinity of Smith Point Island



Borrow Area

Fill material may be obtained from an *in situ* borrow area, a more distant area (which could include an upland site), or from a project that would be dredging materials and is looking for beneficial use of dredged material. Borrow sites determined to be suitable would be evaluated for environmental conditions to ensure that any cultural and/or sensitive resources are fully addressed. Location of a specific borrow site(s) would be based on several factors including the absence of sensitive resources (e.g. oyster reef or other hard bottom substrate), geotechnical and sediment quality, nearby commercial and/or recreational activities, and lateral extent of available material (avoiding a deep borrow site). See Section 5.2.4.3.1 for additional details on the borrow area.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of the Galveston Bay rookery islands would not be constructed and no impacts to geology and substrates would occur. However, the beneficial impacts from implementation of this project would not be realized, resulting in adverse impacts to the rookery islands as they would continue to erode and lose elevation. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.1 and 6.7.1.1 of the Final Phase III ERP/PEIS describe the impacts to geology and substrates from early restoration projects intended to restore and protect birds.

Restoration and enhancement of the rookery islands in Galveston Bay would affect substrates at the placement and borrow sites. Substrates within the footprint of the project would be affected through the placement of clean fill and hard, structural material. The Galveston Bay rookery islands would have minor impacts on substrates geology. Adverse impacts would be minor and local. Long-term benefits would occur to the bottom substrates due to stabilization of sediments protection from erosion.

Mitigation measures to minimize adverse impacts to geology and substrates could include:

- Employment of standard BMPs for construction to reduce erosion and loss of sediments.
- Evaluations of potential borrow sites for environmental conditions as well as cultural and sensitive resources concerns.
- Selection of a borrow site with an optimum footprint and sediment accretion to minimize impacts and expedite rate of recovery at the borrow site.

5.2.5.1.2 Hydrology and Water Quality

Affected Resources

There are three tidal inlets into Galveston Bay, but only two are of major importance with regard to flow. Bolivar Roads (Houston Ship Channel), between Galveston Island and Bolivar Peninsula, accounts for the majority of the tidal exchange between the bay and the Gulf of Mexico. San Luis Pass, between the western end of Galveston Island and Follets Island, is an unaltered inlet that supplies a lesser amount of the bay's tidal exchange. Rollover Pass is by comparison a small enhanced tidal connection through Bolivar Peninsula connecting East Bay with the Gulf of Mexico. Overall, the natural depth of the bay is relatively shallow, 6 to 12 feet. Tides in Galveston under normal conditions are very small in amplitude, usually less than 3 feet between low and high tide. Wind speed and direction within Galveston Bay plays an important role in affecting tide elevation. It can dampen or enhance the height

of waves as well as their potential energy. Prevailing winds are from the southeast, with occasional strong northerly winds that are associated with passing cold fronts. Winds combined with seasonal tide events can greatly exacerbate the tidal range as well as move the range up or down by 1 or 2 feet. Tropical storm tides during Category 4 or 5 hurricanes could be as high as 23 feet above normal water levels (GBEP 2011).

Dickinson Bay Island II

Dickinson Bay is a small estuarine bay fed by Dickinson Bayou on the western shoreline of Galveston Bay. Conditions within Dickinson Bay are influenced predominately by the larger Galveston Bay. Flows in Dickinson Bayou may become significant with rainfall events and thus lower the salinity within Dickinson Bay. The hydrology of the area is affected by tidal actions and the location of the nearby navigation channel. The conceptual design and orientation of the island would account for hydrological pressures in the area. The recent construction of Dickinson Bay Island I, located just northwest of the proposed island would be used as a model for how to deal with hydrology related concerns.

Rollover Bay Island

The hydrology of the surrounding areas of this island is affected by tidal actions between East Bay and the Gulf of Mexico through Rollover Pass and currents associated with GIWW traffic. Tidal currents are fairly strong as water moves between the neighboring waterbodies. These conditions would be evaluated during the engineering design phase of the project to ensure that forces associated with the East Bay fetch, GIWW traffic, and Rollover Pass currents are considered.

Smith Point Island

The Smith Point Island area is associated with Smith Point peninsula. The hydrology of the area is affected by tidal actions and by freshwater inflows from the Trinity and San Jacinto Rivers. Tidal currents are fairly strong as water moves between Trinity Bay and East Bay. High flow pulse events occur associated with the river's discharge can overwhelm tidal currents.

Water Quality

According to the water quality index, Galveston Bay received a poor rating. Galveston Bay is rated fair for dissolved inorganic nitrogen concentrations and rated poor for dissolved inorganic phosphorus concentrations. Thirteen percent of the estuarine area was rated poor for dissolved inorganic nitrogen concentrations, whereas 68% of the estuarine area was rated poor for dissolved inorganic phosphorus concentrations. Expectations for water clarity are similar to those for normally turbid estuaries, with water clarity rated poor at a sampling site if light penetration at 1 meter was less than 10% of surface illumination. Dissolved oxygen conditions in Galveston Bay are rated good (U.S. Environmental Protection Agency 2007). As of August 2015, there are two human health consumption advisories in Galveston Bay for certain seafood species due to high levels of dioxins, polychlorinated biphenyls (PCBs)

and organochlorine pesticides (http://www.dshs.state.tx.us/seafood/advisories-bans.aspx). Within the restoration project areas, the advisory is limited to all species of catfish due to high levels of dioxin and PCBs. Additional information can be found at: https://tpwd.texas.gov/regulations/outdoor-annual/fishing/general-rules-regulations/fish-consumption-bans-and-advisories.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of the Galveston Bay rookery islands would not be constructed and no impacts to hydrology and water quality would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.2 and 6.7.2.1 of the Final Phase III ERP/PEIS describe the impacts to hydrology and water quality from early restoration projects intended to restore and protect birds. For these islands, impacts to hydrology and water quality were analyzed adequately within the PEIS. The PEIS determined that "Creating and enhancing bird nesting and foraging habitat through construction of barrier islands, beaches, and wetlands could result in shoreline stabilization that reduces erosion and reduces adverse impacts to water quality. These would be long-term beneficial effects because they would extend beyond the construction period. Some short-term adverse impacts due to turbidity could occur in the immediate vicinity of the work area. These effects would be minor and short-term as turbidity would dissipate shortly after placement activities are completed."

No impacts to floodplains or hydrology would occur. Temporary, local, and minor impacts to water quality would result from increased turbidity during dredging activities and placement of fill material. Long-term benefits would also occur from the breakwater/armored levee protection of the islands.

Measures to control turbidity and sediment movement would be in place to ensure water quality standards are met and sensitive resources are not affected. These measures may include appropriate water control structures to decant water, as well as the installation of silt fences, hay bales, filter-fabric, and/or temporary levees to control sediments and avoid negative impacts associated with the fill placement.

5.2.5.1.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

Air Quality

The islands are located in an area the EPA designates as the Houston-Galveston-Brazoria Intrastate Air Quality Control Region (HGB). The HGB is in attainment or unclassified with the NAAQS for all criteria pollutants except ozone. The EPA currently lists the HGB as nonattainment for existing ozone standards (http://www.tceq.state.tx.us/airquality/sip/hgb/hgb-status).

Greenhouse Gas (GHG) Emissions

GHGs are chemical compounds found in the Earth's atmosphere that absorb and trap infrared radiation as heat. Global atmospheric GHG concentrations are a product of continuous emission (release) and removal (storage) of GHGs over time. In the natural environment, this release and storage is largely cyclical. For instance, through the process of photosynthesis, plants capture atmospheric carbon as they grow and store it in the form of sugars. Human activities such as deforestation, soil disturbance, and burning of fossil fuels disrupt the natural cycle by increasing the GHG emission rate over the storage rate, which results in a net increase of GHGs in the atmosphere. The principal GHGs emitted to the atmosphere through human activities are CO2, methane, nitrous oxide, and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, with CO2 accounting for the largest quantity GHG emitted.

Criteria air pollutants and GHG emissions are largely generated by electricity production, vehicular movements, and commercial and residential buildings using electricity. GHG emissions would result from both the implementation and operation of the proposed project from the use of vessels during construction and monitoring activities. Engine exhaust from barges, boats, excavators, and equipment would contribute to an increase in GHG emissions. BMPs would be employed to reduce the release of GHG during project implementation.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of the Galveston Bay rookery islands would not be constructed and no impacts to air quality and GHGs would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.3 and 6.7.3.1 of the Final Phase III ERP/PEIS describe the impacts to air quality and greenhouse gas emissions from early restoration projects intended to restore and protect birds. For

these islands, impacts to air quality and greenhouse gas emissions were analyzed adequately within the PEIS. The PEIS determined that "During dredging, excavation or placement of materials to restore or enhance beaches, barrier islands and wetlands for bird habitat there could be short-term minor to moderate adverse impacts to air quality from the use of heavy equipment and vehicles. The severity of impacts would be highly dependent on the length and type of construction required and the location of the project. The use of gasoline and diesel-powered construction vehicles and equipment could contribute to a short-term and minor increase in GHG emissions."

Project implementation would require the use of equipment which would temporarily affect air quality in the project vicinity due to construction vehicle emissions. Excavation associated with construction of portions of the improvements may produce fine particulate matter; however, sediments deposited would be mixed with water, keeping airborne particles to a minimum. Adverse impacts to air quality would be minor, local, and temporary, only occurring during active construction activities.

Based on the assumptions described above, and the small-scale and short duration of the construction portion of the project, predicted GHG emissions would be temporary and minor and would not exceed 25,000 metric tons per year, the threshold for triggering additional requirements for GHG emissions.

5.2.5.1.4 Noise

Affected Resources

Instances of increased noise are expected during the construction phases associated with the restoration project. The proposed project would generate construction noise associated with equipment during placement of the fill material, grading, and dredging. Construction equipment noise is known to disturb fish, marine mammals and nesting shorebirds. The timing of noise producing activities would be planned to minimize disturbance to nesting birds. The majority of construction activities would occur outside of the nesting season. Construction noise would also create a potential nuisance to visitors in areas adjacent to project construction activities. To prevent disturbance to nearby residential communities near Rollover and Smith Point, construction activities that produce significant noise or require precision, such as moving or placing rock would be limited to daylight hours. Construction noise would be temporary and the construction period is not anticipated to last more than 12 months.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of the Galveston Bay rookery islands would not be constructed and no impacts due to noise would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.4 and 6.7.4.1 of the Final Phase III ERP/PEIS describe the impacts caused by noise from early restoration projects intended to restore and protect birds. For these islands, impacts caused by noise were analyzed adequately within the PEIS. The PEIS determined that "During the construction period to create or enhance bird habitat, minor to major short-term adverse impacts to ambient noise levels may occur, particularly at barrier islands and beaches where beach re-nourishment activities would take place. The severity of impacts would depend to a large degree on the location of the project, type of equipment, the amount of noise that these activities would generate, and the distance to sensitive receptors such as recreational users or wildlife. Impacts on noise would be short-term during the construction period."

The proposed Galveston Bay rookery islands would create a minor, localized, and temporary increase in noise.

5.2.5.2 Biological Environment

The Galveston Bay system contains a variety of habitat types, ranging from open water areas to wetlands to upland prairie. Wetlands, seagrass meadows, and oyster reefs are three important habitat types in Galveston Bay. A wide variety of fish, wildlife, plant, and invertebrate populations either reside in or periodically utilize Galveston Bay and its associated habitats, including oysters, finfish, shrimp, crab, birds, sea turtles, and marine mammals (GBEP 2011). The biological environment is divided into two sections: living coastal and marine resources, and protected species.

5.2.5.2.1 Living Coastal and Marine Resources

Affected Resources

Dickinson Bay Island II

Currently the rookery island does not exist. Based on surveys of the submerged bay bottom performed in May 2013, there are no seagrasses or oyster reefs/shell pads at either the north or south site (See pages 4-8 of the Alternatives Analysis by HDR [2014] for further details). Additionally, no seagrasses have been reported by resource agency biologists working in the area.

Rollover Bay Island

The previously deposited dredged material was composed primarily of clays and silts with some sand containing fossil shell and shell fragments. What remains of the original island would be classified under the Cowardin classification system as Estuarine Intertidal Reef and Emergent or Scrub-Shrub wetland. As the island eroded the associated shell from the dredging operation remained and provides Intertidal and Subtidal Reef substrate habitat. Shell material would be avoided during construction, when possible. This shell material is not part of an accreting reef dominated by living eastern oysters and does

not have commercial fisheries value; however, the shell reef is an important ecological habitat in Galveston Bay. Existing shell material, tidal and subtidal, would be enhanced by the placement of shell material in order to compensate for any unavoidable collateral injury to hard substrate. In the areas which vegetation exists, it is primarily comprised of common reed (*Phragmites australis*), high tide bush (*Iva frutescens*), sea oxide daisy (*Borrichia frutescens*), and sea purslane (*Sesuvium* sp.).

While nesting activity of colonial waterbirds has seriously declined in recent years, birds continue to use Rollover Bay Island for staging, loafing, roosting, and possible nesting sites. Non-colonial waterbirds, primarily the American oystercatcher (*Haematopus palliates*) and eastern willet (*Catoptrophorus semipalmatus)*, may use the existing island for nesting as well. The island supports limited colonial waterbird nesting and little species diversity due to its diminishing size and habitat loss. Limited to no nesting took place during 2013 and 2014 on what remains of the island (Hackney and Woodrow, pers. comm. 2014).

Smith Point Island

Smith Point Island was likely a natural reef island associated with a suite of reef islands mapped in 1921 (NOAA 1921). Over time, much of the sediment has eroded. Currently, the island is a long, narrow piece of land that is rapidly eroding and is now mainly comprised of winnowed oyster shell that was left behind after the lighter dredged sediments eroded away. The shell is continually moved by wave energy which inhibits the accumulation of soil or fine shell material and therefore limits the extent of vegetation establishment. Harsh environmental conditions have limited the presence of vegetation to only a few salt cedar (*Tamarix* sp.) and limited herbaceous vegetation including sea purslane and seaside tansy which can tolerate the salinity exposure (Hackney pers. comm. 2014).

Smith Point Island has intertidal and supratidal habitat and there is emergent habitat between the island and the breakwater. The island is currently classified under the Cowardin classification system as Estuarine Intertidal Reef. Surrounding the island are large areas of Estuarine Subtidal Reef (i.e. oyster/shell reef) habitat. Located near the island are significant accreting Eastern oyster reefs, oyster leases, and hard bottom substrate. Due to the highly productive nature of these reefs and their accreting conditions, measures would be employed to avoid impacts to these resources. Surveys delineating the presence, type and extent of reef and bottom substrates would be completed prior to finalizing full project elements and design. Eastern oyster reefs would be avoided during construction and are not within the footprint of the proposed action.

While nesting activity of colonial waterbirds has declined in recent years, birds continue to use Smith Point Island for staging, loafing, roosting, and possible nesting sites. The island supports limited colonial waterbird nesting and little species diversity due to changes in vegetation and habitat loss from erosion. Non-colonial waterbirds, primarily the American oystercatcher and the eastern willet, may use the existing island for nesting as well.

All Three Islands

Seagrasses are not expected at any of these islands and sea grasses were not identified using the TPWD seagrass viewer (http://tpwd.texas.gov/gis/seagrass/). However, any seagrasses encountered during any surveys would be documented and measures would be taken to avoid and minimize any impacts.

There are a number of aquatic species found in the island restoration areas. Fish species include sand seatrout, spotted or speckled seatrout, red drum, tonguefish, flounders, Atlantic bumper, and porgys. Benthic organisms include bivalves, gastropods and other mollusks, amphipods, annelids, and brown and white shrimp.

Water dependent birds may use the open bay to forage and roost. These would include loons, bay ducks, gulls, terns, and pelicans. Non-avian terrestrial wildlife has not been observed at either existing island (Rollover Bay and Smith Point Islands). Texas diamondback terrapins (*Malachlemys terrapin)* may use the existing islands and surrounding waters.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of the Galveston Bay rookery islands would not be constructed and no impacts to living coastal and marine resources would occur. However, the beneficial impacts from implementation of this project would not be realized, resulting in the continued degradation of the nesting habitat and adverse impacts to colonial waterbirds. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.5, 6.3.8.6, 6.7.5, and 6.76 of the Final Phase III ERP/PEIS describe the impacts to habitats and living coastal and marine resources from early restoration projects intended to restore and protect birds. The PEIS determined that "Creating and enhancing bird habitat would create long-term benefits from increasing stability and resiliency of barrier islands and beaches."

The PEIS also found that "some short-term adverse impacts could occur from dredging and other borrowing techniques which result in suspended sediments and increased near-site turbidity." Adverse effects from dredging may include:

- Dredged sediment removed the bay bottom could impact local benthic organisms on or near the borrow site from increased turbidity, substrate disturbances or siltation, which could locally increase mortality and inhibit activities in the short-term until the site recovered.
- Increased turbidity could limit available light necessary for photosynthesis, and disruption in the water column and surface water could disturb some pelagic microfaunal communities. These

impacts would be short-term and minor because pelagic microfaunal communities would re-establish once the turbidity dissipates.

- Fish present in the dredging area could be subject to a temporary increase in sound pressure levels, a decrease in water quality, entrainment in dredge sediments, and removal of benthos from dredged areas. Sound pressure level increases or entrainment could result in mortality of individual finfish. This would be a minor short-term adverse effect that would not be expected to reduce local fish populations.

- Birds using the sites as roosting and/or loafing areas would be forced to other parts of the island or other surrounding areas during construction activities. This would be temporary, however, and once the project was completed, the project would have long-term benefits to birds for these uses.

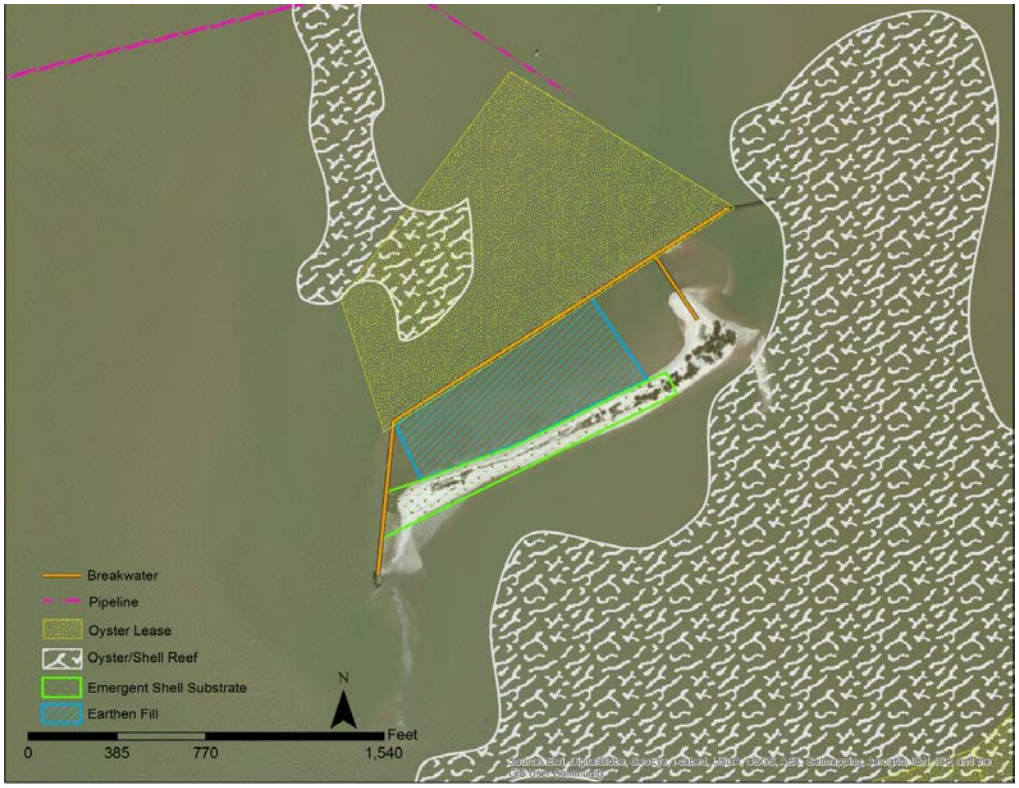
- Any breeding birds using the islands would be avoided by restricting construction to the non-nesting period.

Dredging from a direct dredge aquatic borrow site would change substrate topography, indirectly impacting benthic and other aquatic organisms using this habitat. Depending on the depth-of-cut, dredging could result in low dissolved oxygen in bottom waters. The depth-of-cut is planned to be as shallow as is feasible. This project would likely result in short-term minor adverse impacts due to construction and dredging-related disturbances and small changes to sessile species populations if present. However, there would likely be no impact to feeding, reproduction, or other factors affecting population levels. Short-term, localized minor impacts to fish and wildlife resources would occur during the construction phase of the project. Mobile aquatic animals including birds would be expected to move away from the fill and borrow sites during construction and return following completion of construction. Isolated, short-term effects on pelagic fish eggs and larvae in the immediate area may occur. Sessile and other limited movement species, especially those buried/burrowed in the substrate could be injured or killed by the dredging activity and the placement of the fill material at the island. However, these types of species are typically numerous and recolonize quickly. Any adverse impacts to marine and estuarine fauna (fish, shell beds, benthic organisms) are expected to be temporary, localized, and minor as those species that would be affected are likely numerous in the area.

The potentially impacted areas, including the borrow area and island construction areas, would be surveyed prior to construction for the presence of sensitive resources. Seagrasses are not expected at any of these islands. However, any seagrasses encountered during the surveys would be documented and measures would be taken to avoid and minimize any impacts. Of primary concern is the presence of oyster reef habitats and oyster leases on or near Smith Point Island (Figure 5-8 and Figure 5-9). Once mapped, construction activities would be designed and coordinated to avoid any impacts to oyster leases and other significant oyster reefs. Hard substrate composed of winnowed shell material may also be present at the construction sites. BMPs would be used to avoid and minimize potential impacts and may include alternative construction methods as appropriate. Any impacts incurred after avoidance and

minimization measures are taken would be fully mitigated by restoring an equal or greater amount of hard substrate.

Figure 5-9. Location of oyster reefs and commercial oyster leases in the vicinity of Smith Point Island



The project would provide overall long-term benefits to marine species by providing additional structural fish habitat and increased hard substrate productivity. Over the life of the project, the quality of aquatic habitat would increase. The construction of an intertidal or subtidal breakwater or armored levee would provide long-term benefits to marine species by providing additional hard structure (including crevices and interstitial voids) habitat. Additionally, reducing erosion could benefit oyster populations that can be adversely affected by excessive sediment in nearshore waters.

The shoreline length of each of the islands would increase from what it is today. The new shoreline areas would be gradually slopped into the water creating sufficient tidal fringe to support wetlands. The breakwater would also protect both existing and created shoreline from erosion and reduce wetland loss from erosion.

Construction activities would cause temporary impacts to wildlife due to the presence of people and use of heavy equipment on the island. These impacts would last for the duration of construction, which is estimated to be a maximum of 12 months. Permanent impacts result from alterations to the island and associated habitat would provide long-term benefit to nesting birds. Natural colonization would occur which would provide grassy substrate in addition to the vegetative plantings of scrub-shrub vegetation, both of which could be used by the colonial nesting birds.

To prevent invasive exotic species from inhibiting nesting activities the islands would be monitored for the presence of undesirable exotic species. If they negatively impact nesting activities, appropriate treatment methods would be used to remove them.

5.2.5.2.2 Protected Species

Protected species and their habitats include ESA-listed species and designated critical habitats, which are regulated by either the USFWS or the National Marine Fisheries Service (NMFS). Protected species and habitat also include marine mammals protected under the Marine Mammal Protection Act, essential fish habitat (EFH) protected under the Magnuson-Stevens Fishery Conservation and Management Act, migratory birds protected under the Migratory Bird Treaty Act and eagles protected under the Bald and Golden Eagle Protection Act.

Affected Resources

Threatened or Endangered Species

Five species of endangered or threatened species of sea turtles were identified as possibly being present in Galveston Bay and at each of the island restoration sites: loggerhead, green, hawksbill, leatherback, and Kemp's ridley sea turtles. Sea turtles nest on beaches, and most species use nearshore hard bottom reef complexes, shallow water habitat (including seagrasses), or other coastal areas with rocky bottoms to forage for food. The island restoration sites and their project areas have not been designated as critical habitat for any of the sea turtle species. Sea turtle nesting activities are not expected to occur here since there is no beach habitat; however, sea turtles could be encountered in the open water.

West Indian Manatee has been documented in Galveston Bay, although sightings are extremely rare. The manatee feeds on vegetation, is slow moving, and somewhat intolerant of cold water temperatures. There is the possibility that it may be present during construction activities.

Two species of threatened bird species are identified as possibly occurring in the construction areas: piping plover and red knot. The piping plover is a migrant and winter resident on the Texas coast and occurs in Galveston County. Piping plovers are not expected to occur at either Rollover Bay Island or Smith Point Island where construction activities would occur because typical habitats, beach and bayside tidal flat habitats, for the species are not present. Rollover Bay Island is located near (approximately 0.5 miles) critical habitat for the piping plover. All equipment, vessels, and people will avoid piping plover critical habitat. The GIWW, which is a major marine transportation corridor, is situated between the

project area and the critical habitat. Any activities related to implementation of the project will not take place in the area considered critical habitat. The red knot is primarily migratory in Galveston County. However, there are no documented records of red knots on Rollover Bay Island. Migration of the red knot has been observed during the Smith Point Hawk Watch, approximately 1.5 miles from Smith Point Island. Red knots are not expected to occur in the construction area because typical habitats, beach and bayside tidal flat habitats, for the species are not present. Individual piping plovers or red knots could rest at Rollover Bay or Smith Point Islands during their migration. No proposed island sites are located within critical habitat for these species. However, Rollover Bay Island is located near (approximately 0.5 miles) critical habitat for the piping plover. All equipment, vessels, and people would avoid piping plover critical habitat.

Essential Fish Habitat (EFH)

EFH in the project's area of effect is identified and described for various life stages of 12 managed fish and shellfish (Gulf of Mexico Fisheries Management Council 2005). The Galveston Bay rookery islands are located in an area that is designated as EFH under the Magnuson-Stevens Fishery Conservation and Management Act for several species of shark, shrimp, coastal migratory pelagic species, and reef fish (Table 5-3 and Table 5-4). No Habitat Areas of Particular Concern or EFH Areas Protected from Fishing were identified at the project location.

Table 5-3. EFH for estuarine habitats within the vicinity of the Galveston Bay rookery islands proposed area of effect

Species Common Name	Eggs	Larvae	Post Larvae	Early Juvenile	Late Juvenile	Adult	Spawning Adult
Estuarine Emergent Marsh							
Red Drum			●	●	•	●	
Gray Snapper						●	
Brown Shrimp				●			
White Shrimp				●			
Estuarine Oyster Reef							
Brown Shrimp				●			
Estuarine Sand and Shell Bottom							
Red Drum			●		•	●	
Gray Snapper						●	
Lane Snapper				●	●		
Brown Shrimp				●			
Estuarine Mud/Soft Bottom							
Red Drum		●	●	●	•	●	
Gray Snapper						●	
Lane Snapper				●	●		
Brown Shrimp				●			

Species Common Name	Eggs	Larvae	Post Larvae	Early Juvenile	Late Juvenile	Adult	Spawning Adult
White Shrimp				●			

(● indicates habitat type designated as EFH for species' life stage)

Table 5-4. Highly migratory species EFH designations within the proposed area of effect

Species Common Name	Life Stage Within Estuarine Waters
Scalloped Hammerhead Shark	Neonate & Juvenile
Blacktip Shark	Neonate, Juvenile & Adult
Bull Shark	Neonate, Juvenile & Adult
Lemon Shark	Neonate
Spinner Shark	Neonate & Juvenile
Bonnethead Shark	Neonate, Juvenile & Adult
Atlantic Sharpnose Shark	Neonate, Juvenile & Adult

Marine Mammals

The bottlenose dolphin and the West Indian Manatee (manatees are protected under the Endangered Species Act) are the only marine mammals known to occur in the Galveston Bay system. Manatees are extremely rare in Texas waters with sightings less than one per year on average across the entire Texas coast. Due to the relatively shallow depth of the surrounding areas of the islands, less than 6 to 12 feet, and the established ranges and depths that the majority of the cetaceans occupy, additional marine mammals would not be expected to enter the construction area.

Bald and Golden Eagles

There are eagle home ranges or established territories within the rookery island areas. Eagles have been observed at Smith Point during the fall migration Hawk Watch. Bald eagles may be found in the vicinity of Dickinson Bay since nests have been documented in near inland sites surrounding Galveston Bay. No eagles are nesting within 660 feet of any of the islands. Golden eagles have been documented at the Smith Point Hawk Watch during fall migration, however they have occurred in limited numbers and their presence is temporary.

Migratory Birds

Dickinson Bay Island II

Dickinson Bay Island II does not currently exist. The two currently proposed locations provide habitat for migratory birds that use open bay habitat for fishing, staging and roosting purposes.

For non-breeding migratory birds, the open water site currently supports roosting and foraging use. The different bird taxonomic guilds and use activities are listed below:

Loons and Grebes – This group of birds may use waters surrounding the site locations during the fall, winter, and spring to forage. Presence in the area would be based on available forage fish and invertebrates. Construction activities may cause the birds to move to other foraging areas; however, no take is anticipated.

Waterfowl – Surrounding bay waters are used by several species of wintering waterfowl, primarily bay ducks. This group may be affected by construction activities. The temporary nature of construction and this bird group's use of other available waters nearby will avoid take.

Pelicans and Cormorants – These would use the open bay to forage. Construction activities would cause the birds using the area to move to other locations in the bay. Acclimation to construction activities may take place.

Terns and Gulls – These species would use the open bay habitat to forage. These birds would move to other nearby sites in the bay system to forage.

The disruptions caused by construction activities would be temporary and once completed the restored island would provide a greater range of habitats available for birds to use. Increased vegetation would improve habitats that are essential for nesting colonial waterbirds and provide a long-term benefit. The proposed actions would support the project goal to increase the number of nesting pairs of colonial waterbirds. The proposed actions would also provide more opportunity for many of the above listed bird groups as well as other guilds during the non-nesting season.

Rollover Bay Island

Rollover Bay Island provides some habitat for use by migratory birds. The island supports limited colonial waterbird nesting and little species diversity due to its diminishing size and habitat loss. Limited to no nesting took place during 2013 and 2014 on what remains of the island (Hackney and Woodrow, pers. comm. 2014). It does however support staging, resting, and roosting habitat for those species that used the site historically for nesting (Table 5-5). Non-colonial waterbirds, primarily the American oystercatcher and eastern willet, may use the existing island for nesting as well.

Table 5-5. Historical nesting use of Rollover Bay Island by colonial waterbird species

Common Name	Scientific Name
Brown Pelican	*Pelicanus occidentalis*
Neotropic Cormorant	*Phalacrocorax brazilianus*
Great Egret	*Ardea alba*
Great Blue Heron	*Ardea herodias*
Snowy Egret	*Egretta thula*
Tricolored Heron	*Egretta tricolor*
Reddish Egret	*Egretta rufescens*

Common Name	Scientific Name
Cattle Egret	*Bubulcus ibis*
Black-crowned Night Heron	*Nycticorax nycticorax*
Roseate Spoonbill	*Platalea ajaja*
White Ibis	*Eudocimus albus*
Laughing Gull	*Leucophaeus atricilla*
Forster's Tern	*Sterna forsteri*
Black Skimmer	*Rynchops niger*

For non-breeding migratory birds the island currently supports roosting and limited foraging use. The different bird taxonomic guilds and use activities are listed below:

Loons and Grebes – This group of birds may use surrounding waters during the fall, winter, and spring to forage. Presence in the area would be based on available forage fish and invertebrates. Construction activities may cause the birds to move out of nearby foraging areas; however, no take is anticipated.

Waterfowl – Waterfowl use of the island is limited. Surrounding bay waters are used by several species of wintering waterfowl, primarily bay ducks. However, the existing activity of the area (GIWW and recreational fishing) would limit the presence of this group of birds, primarily bay ducks. This group would use nearby bayside shallow waters adjacent to the shoreline north of the GIWW. These locations are distant from the project site. This group may be affected by construction activities. The temporary nature of construction and this bird group's use of more undisturbed waters nearby will avoid take.

Pelicans and Cormorants – These would significantly use the existing island for resting, staging and or roosting during the fall, winter and spring. Construction activities would cause the birds using the island to move to other sites. Acclimation to construction activities may take place.

Wading Birds – These heron and egret species may use the existing island to some degree for resting and may use the shallow intertidal zone to feed. This use would be limited. Construction activities may cause the birds to move out of nearby foraging areas; however, no take is anticipated.

Terns and Gulls – These species would use the island site significantly for resting, staging and or roosting. Foraging areas would constantly change depending on the presence of forage fish, currents, etc. and thus may or may not be proximal to the site. These birds would move to other nearby sites in the bay system to use for these purposes.

Shorebirds – Significant numbers of shorebirds migrate through the Texas coast in the fall and spring and there is limited forage habitat within the intertidal zone of the island. Construction activities may limit the use of the island by these birds. The tidal flats which lay south of the GIWW that border the bayside of Bolivar peninsula provide significant habitat for shorebirds. Shorebirds would be present in this area. Construction activities would avoid this area used by shorebirds by restricting activities to the GIWW and the area identified for island construction north of the GIWW.

The disruptions caused by construction activities would be temporary and once completed the restored island would provide a greater range of habitats available for birds to use. Increased vegetation would improve habitats that are essential for nesting colonial waterbirds and provide a long-term benefit. The proposed actions would support the project goal to increase the number of nesting pairs of colonial waterbirds. The proposed actions would also provide more foraging and resting opportunity for many of the above listed bird groups as well as other guilds during the non-nesting season.

Smith Point Island

Smith Point Island is an important site for migratory birds. While nesting activity of colonial waterbirds has declined in recent years, waterbirds that used the site historically for nesting continue to use Smith Point Island for staging, loafing, roosting, and possible nesting sites (Table 5-6). The island supports limited colonial waterbird nesting and little species diversity due to changes in vegetation and habitat loss from erosion. Non-colonial waterbirds, primarily the American oystercatcher and the eastern willet, may use the existing island for nesting as well. By the time construction begins, the island may no longer exist to support any avian use. However, the project location would still provide habitat for migratory birds that use open bay habitat for fishing, staging and roosting purposes.

Table 5-6. Historical nesting use of Smith Point Island by colonial waterbird species

COMMON NAME	SCIENTIFIC NAME
Brown Pelican	*Pelicanus occidentalis*
Neotropic Cormorant	*Phalacrocorax brazilianus*
Double-crested Cormorant	*Phalacrocorax auritus*
Great Egret	*Ardea alba*
Great Blue Heron	*Ardea herodias*
Snowy Egret	*Egretta thula*
Little Blue Heron	*Egretta caerulea*
Tricolored Heron	*Egretta tricolor*
Reddish Egret	*Egretta rufescens*
Cattle Egret	*Bubulcus ibis*
Black-crowned Night Heron	*Nycticorax nycticorax*
Roseate Spoonbill	*Platalea ajaja*
White Ibis	*Eudocimus albus*
White-faced Ibis	*Plegadis chihi*
Laughing Gull	*Leucophaeus atricilla*
Gull-billed Tern	*Gelochelidon nilotica*
Royal Tern	*Thalasseus maxima*
Sandwich Tern	*Thalasseus sandvicensis*
Forster's Tern	*Sterna forsteri*
Least Tern	*Sternula antillarum*
Black Skimmer	*Rynchops niger*

For non-breeding migratory birds the island currently supports roosting and limited foraging use. The different bird taxonomic guilds and use activities are listed below:

Loons and Grebes – This group of birds may use surrounding waters during the fall, winter, and spring to forage. Presence in the area would be based on available forage fish and invertebrates. Construction activities may cause the birds to move out of nearby foraging areas; however, no take is anticipated.

Waterfowl – Waterfowl use of the island is limited. Surrounding bay waters are used by several species of wintering waterfowl, primarily bay ducks. This group may be affected by construction activities. The temporary nature of construction and this bird group's use of more undisturbed waters will avoid take.

Pelicans and Cormorants – These would significantly use the existing island for resting, staging and or roosting during the fall, winter and spring. Construction activities would cause the birds using the island to move to other sites. Acclimation to construction activities may take place.

Wading Birds – These heron and egret species may use the existing island to some degree for resting and may use the shallow intertidal zone to feed. This use would be limited. Construction activities may cause the birds to move out of nearby foraging areas; however, no take is anticipated.

Terns and Gulls – These species would use the island site significantly for resting, staging and or roosting. Foraging areas would constantly change depending on the presence of forage fish, currents, etc. and thus may or may not be proximal to the site. These birds would move to other nearby sites in the bay system to use for these purposes.

Shorebirds – Significant numbers of shorebirds migrate through the Texas coast in the fall and spring and these may use the intertidal zone to forage. Several species overwinter as well and may use the intertidal areas of the existing island to forage. Construction activities may limit the use of the island by these birds. There are other sites nearby that would serve similar uses.

The disruptions caused by construction activities would be temporary and once completed the restored island would provide a greater range of habitats available for birds to use. Increased vegetation would improve habitats that are essential for nesting colonial waterbirds and provide a long-term benefit. The proposed actions would support the project goal to increase the number of nesting pairs of colonial waterbirds. The proposed actions would also provide more foraging and resting opportunity for many of the above listed bird groups as well as other guilds during the non-nesting season.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of the Galveston Bay rookery islands would not be constructed and no impacts to protected species would occur. However, the beneficial impacts from implementation of this project would not be realized, resulting in the continued degradation of the nesting habitat and adverse impacts to colonial waterbirds. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.5, 6.3.8.6, 6.7.5, and 6.76 of the Final Phase III ERP/PEIS describe the impacts to habitats and living coastal and marine resources from early restoration projects intended to restore and protect birds. The PEIS determined that "Creating and enhancing bird habitat would create long-term benefits from increasing stability and resiliency of barrier islands and beaches."

The PEIS also found that "some short-term adverse impacts could occur from dredging and other borrowing techniques which result in suspended sediments and increased near-site turbidity." Adverse effects from dredging may include:

- Sea turtle and marine mammal individuals may be present in project areas where dredging or underwater use of equipment is occurring. They could be subjected to temporary increased noise, turbidity, and water quality changes. These activities could temporarily displace individuals or prey during construction and could result in short-term, minor impacts. Consultation with appropriate agencies would be required prior to final design and project implementation. Guidelines provided by NOAA and USFWS to avoid and minimize potential impacts to sea turtles or marine mammals will be followed.

- Piping plover and red knot may be present at Smith Point and/or Rollover Bay Islands. However, their presence is very unlikely since their preferred habitat is not present at these sites. Rollover Bay Island is located near critical habitat for the piping plover. Specific BMPs would be incorporated to cover all activities associated with the project to ensure that construction activities are planned to avoid individual birds and critical habitat during project activities and that no adverse impacts would occur. If individuals are present and disturbed by the noise, they would have access to nearby habitat that is within their normal flying distances for daily foraging movement. Upland excavation activities will not occur in habitat used by piping plovers or red knots.

- Fish present in the dredging area could be subject to a temporary increase in sound pressure levels, a decrease in water quality, entrainment in dredge sediments, and removal of benthos from dredged areas. Sound pressure levels or entrainment could result in mortality of individual finfish. This would be a minor short-term adverse effect that would not be expected to reduce local fish populations or designated EFH. Best management practices to minimize both short-term construction impacts and long-term impacts to sensitive habitats, included in the EFH assessment, will be followed during project implementation.

- Birds that forage in or near the dredge site could be temporarily affected. However, these effects would be short-term and minor as birds would be expected to move away to forage in other readily available foraging habitat during the dredging. Consultation with appropriate agencies would be required prior to final design and project implementation.

- Birds using the sites as roosting and/or loafing areas would be forced to other parts of the island or other surrounding areas during construction activities. This would be temporary, however, and once the project was completed, the project would have long-term benefits to birds for these uses.
- Any breeding birds using the islands would be avoided by restricting construction to the non-nesting period.

Methods used to remove material from the borrow site would be with a cutter head dredge or a clamshell dredge both of which would have minimal impacts to pelagic species. Placement of fill material is a slow process allowing plenty of time for sea turtles to leave the area. Island construction activities are not expected to have impacts to protected marine species and their habitats in the areas where the materials would be placed. Short-term minor impacts may occur if species using the project area are temporarily disturbed and must move to another area. Impacts to wildlife would be avoided via management guidelines and techniques as appropriate; therefore, restoration activities are not likely to adversely affect federally-listed sea turtles. Additionally, the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) and Measures for Reducing Entrapment Risk to Protected Species (NMFS 2012) would be followed. Long-term impacts would be beneficial with the addition of hard substrate that would support a more diverse community of benthic organisms and fish.

NMFS concurred with the EFH assessment for the project, which determined that temporary and permanent impacts would occur to estuarine water column and underlying submerged estuarine soft bottom habitat categorized as EFH under provisions of the Magnuson-Stevens Fishery Conservation and Management Act (NMFS 2015). Project implementation would directly impact estuarine soft bottom EFH to create upland colonial waterbird nesting islands. Both dredging and fill placement locations would be sited to avoid sensitive estuarine habitats such as oyster reefs and seagrasses. Best management practices to minimize both short-term construction impacts and long-term impacts to sensitive habitats will be followed.

The Trustees initiated consultations pursuant to Section 7 of the Endangered Species Act with the NMFS' Protected Resources Division (initiated July 7, 2015) and the USFWS Texas Coastal Ecological Services Field Office (initiated August ?, 2015). The Trustees are coordinating with USFWS to determine if this project requires authorization under the Marine Mammal Protection Act. The Trustees have completed coordination and reviews with NOAA under the Marine Mammal Protection Act. The Trustees have also initiated review of the proposed project for impacts to bald eagles and migratory birds in accordance with the Migratory Bird Treaty Act as well as the Bald and Golden Eagle Protection Act.

Comment [JG1]: Add date when consultation is initiated

Temporary and localized turbidity impacts during dredging and placement of fill for the construction of the island could impact EFH. The restoration of the islands would result in the permanent loss of 20 acres of submerged bay habitat designated as EFH for federally managed fish species through the filling of existing estuarine water column and the underlying estuarine mud/sand/shell substrates to convert these aquatic areas to uplands suitable for bird nesting. If dredging is required for site access or to

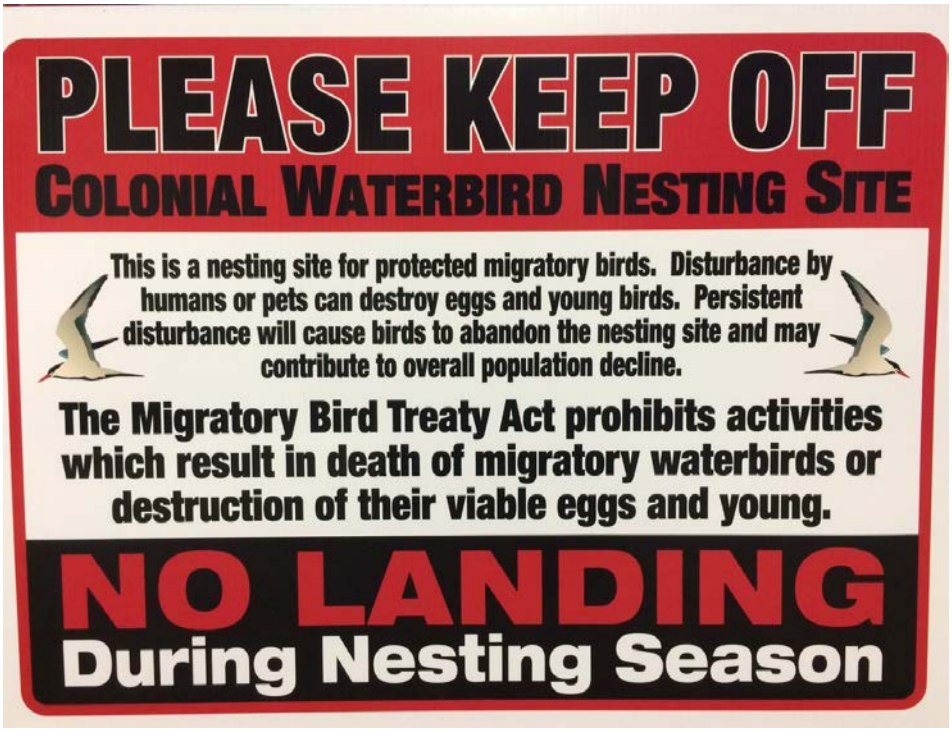
obtain fill for island restoration that would also result in EFH impacts. To prevent adverse impacts to oyster reefs, locations proposed for dredging would avoid excavation of oyster reef habitat. Proposed dredge sites would also be located in slightly deeper open water habitat. Impacts to existing soft bottom benthic habitat at these dredging locations would be minor and temporary, as the benthic invertebrate communities would quickly re-establish. The proposed breakwaters would result in the permanent filling of EFH. However, the submerged side slopes of the breakwaters would provide hard substrate with interstitial spaces that would enhance foraging areas for fish as well as provide cover for juvenile fish and substrate for establishment of oyster habitat.

Any adverse impacts to marine and estuarine fauna (fish, shell beds, benthic organisms) are expected to be short in duration and minor as those species that would be affected are likely numerous in the area. The project would provide benefits to marine and estuarine fauna by providing additional structural fish habitat which would compensate for loss of benthic bay bottom habitat. Over the life of the project, the quality of aquatic habitat would increase.

The marine mammals that may use Galveston Bay (e.g. dolphins and manatees) would leave the area to avoid the construction activities and/or would generally avoid the area because optimal habitat does not exist. Manatees are extremely rare in Texas waters with sightings less than one per year on average across the entire Texas coast. However, if marine mammals are sighted within 50 feet of the construction area, work would stop until the animals move away from the area under their own volition. Therefore, marine mammals would not be impacted during construction activities and no incidental take of marine mammals is anticipated.

Construction activities would be relatively short-term and for those island enhancement sites which support nesting at the time of project implementation, would occur outside of the nesting season period, and would therefore not affect any bird nesting activities. Birds using the site for loafing and resting during the construction window may use existing island features during construction if they become acclimatized to the activities. Birds using the nearby open water for foraging may also be displaced to sites more remote from the island or borrow site. Some minor and temporary displacement of local foraging and roosting birds could occur during operations. After completion of the island restoration and protection, disturbance during nesting could occur by recreational users. These can include anglers, boaters, and photographers that could approach too closely or disembark on the island. Signs would be placed on and adjacent to the island making users aware that nesting birds are present (Figure 5-10). Disturbing nests is a violation of the Texas Parks and Wildlife Code and the Migratory Bird Treaty Act. Any mortality to chicks would violate state and federal statutes.

Figure 5-10. Example of sign approved by the TGLO, TPWD Law Enforcement, and USFWS Law Enforcement to warn against disturbing nesting birds



The disruptions caused by construction activities would be temporary and once completed the restored island would provide a greater range of habitats available for birds to use. Increased vegetation would improve habitats that are essential for nesting colonial waterbirds and provide a long-term benefit. The proposed actions would support the project goal to increase the number of nesting pairs of colonial waterbirds. The proposed actions would also provide benefits for many of the above listed bird groups as well as other guilds during the non-nesting season.

5.2.5.3 Human Uses and Socioeconomics

Galveston Bay has supported economic growth in the region and is surrounded by intensive urban and industrial development. Resources in the Galveston Bay watershed have been utilized for construction, transportation, oil, gas and petrochemical production, water supply, fisheries, agriculture and recreational uses. Projected growth in population and economic activity would result in increasing use of the bay resources. Major expansions and management changes are in progress or proposed for the ports and navigation channels in the Galveston Bay system. More people would place more demands on water supply, roads and highways, and land for development (GEBP 2011). This section includes discussions of cultural resources, aesthetic and visual resources of the region, tourism and recreational use in the area, and a general characterization of public health and safety issues.

5.2.5.3.1 Cultural Resources

Affected Resources

Coordination under Section 106 National Historic Preservation Act has been initiated for all projects. Initial surveys for cultural resources have been conducted in the Dickinson Bay Island II area. However, since a specific site has not yet been chosen, the review under Section 106 of the National Historic Preservation Act has not yet been completed.

Currently, survey work for cultural resources has not been conducted at Rollover Bay Island or Smith Point Island.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of the Galveston Bay rookery islands would not be constructed and no impacts to cultural resources would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

If any culturally or historically important resources are identified during project preparations or pre-deployment surveys, such areas would be avoided during construction. A complete review of this project under Section 106 of the National Historic Preservation Act is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse effects on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

5.2.5.3.2 Aesthetics and Visual Resources

Affected Resources

The affected environment consists of the construction footprint of the islands and the borrow site. The landscape in the vicinity of the proposed islands is characterized by a mosaic of open water, coastline, and rookery islands. There are no designated protected viewsheds in the vicinity of the islands. Equipment and construction activities related to island restoration would be visible.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of the Galveston Bay rookery islands would not be constructed and no impacts to aesthetics and visual resources would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.4.8 and 6.7.14 of the Final Phase III ERP/PEIS describe the impacts to aesthetics and visual resources from early restoration projects types, including restore and protect birds. For these islands, impacts to aesthetics and visual resources were analyzed adequately within the PEIS. The PEIS determined that "project types involving the use of construction equipment, including equipment used for the movement and placement of materials (i.e. barges) and barriers enacted to protect public safety would result in some minor to moderate short-term adverse impacts on aesthetics and visual quality. These impacts result from the presence of equipment, barriers and construction-related dust and emissions. During the construction period, visible impedances would detract from the natural landscape and create visual contrast for observers visiting the project areas. Over the short-term, there would be a change in the viewshed that would be readily apparent and that would attract attention. Although such changes would not dominate the viewshed, they would detract from current user activities or experiences…Restoration, improvement and wetland and habitat creation project types would lead to long-term beneficial impacts from the increased visual character of the landscape occurring from the projects restoring or enhancing areas to their natural conditions and over-time, increasing the scenic quality of the project area."

During construction, there would be temporary, minor adverse aesthetic and visual impacts for recreational boaters and fishermen due to the use of construction equipment in and around the project area. However, there would be a long-term beneficial impact to visual and aesthetic resources once the island restoration is completed.

5.2.5.3.3 Tourism and Recreational Use

Affected Resources

Approximately 5 million people live around Galveston Bay. The Galveston Bay rookery islands are considered an important resource area by the local communities. The area is heavily used by nature watchers and attracts a substantial number of visitors. While the rookery islands are located away from any land-based viewing areas; they can be viewed by the public using motorboats and paddle craft. Birds associated with the islands use surrounding habitats readily accessible from land based viewing opportunities. Galveston Bay is used by a wide range of tourists and recreational users. Commercial and recreational fishing, boating, and potentially wildlife viewing occurs in the open water areas. Recreational angling is significant and is primarily conducted from boats near the rookery islands.

Fisherman and boaters may use areas near Dickinson Bay Island II for recreational or commercial purposes and the navigation channel may be used by vessels for transportation.

The Rollover Bay and Pass area is heavily used by recreational anglers. The period of highest recreational use overlaps with the bird nesting season of February 1 through August 15. Recreational anglers may wade fish, use motorized boats or use paddling craft such as kayaks and/or canoes. Within Rollover Bay, most wade fishing takes place south of the GIWW since traffic and depth prevent waders crossing the GIWW. Recreational use impacts would be limited since much of the construction would occur outside of the period of highest recreational use and north of the GIWW, minimizing potential impacts to wading anglers.

The community of Smith Point located on Smith Point peninsula contains homes and structures, commercial facilities, recreational vehicle parks, docks and marinas, a local park (Robbins Park) and Candy Abshier Wildlife Management Area, as well as less than 200 residents. Most residents are associated with commercial fishing, ranching, and farming activities. The location has substantial number of recreational visitors that include fishing, paddling, and bird/nature watching. The Candy Abshier Wildlife Management Area hosts an annual hawk watch census during the fall which attracts many visitors. The local community considers the rookery island a valuable resource and as an important engine that creates bird resources important to maintain for tourism. There is navigation that takes place near Smith Point associated with commercial oyster activities. Consideration would be provided to established users and to occasional users through the use of public meetings and signage at the Smith Point dock facility.

Efforts would be made to avoid or minimize impacts to public boat launch facilities. Appropriate signage and buoys markers at the site and at boat ramps would be displayed. Postings in local media would also take place to ensure that efforts are made to inform recreational users. Due to the potential increased small boat traffic (construction related) in the area, appropriate safety measures would be employed to ensure that water related accidents and conflicts are minimized.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of the Galveston Bay rookery islands would not be constructed and no impacts to tourism and recreational use would occur. However, the beneficial impacts to tourism and recreational use due to implementation of this project would not be realized. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.4.5 and 6.7.11 of the Final Phase III ERP/PEIS describe the impacts to tourism and recreational use from early restoration projects types, including restore and protect birds. For these islands, impacts to tourism and recreational use were analyzed adequately within the PEIS. The PEIS determined that "project types involving the removal and placement of dredged materials, ground or substrate disturbing construction activities as well as restoration activities could result in some short-term minor to moderate adverse impacts to wildlife viewing, short-term minor to moderate adverse impacts to hunting, beach and waterfront visitors, and tourism and short-term minor to moderate adverse impacts to fishing. Impacts to these different resource areas stem from (1) temporary site closures enacted to protect public safety; and (2) construction activities and associated wildlife disturbances. These activities may limit tourism and recreational uses accessibility and opportunities." Long-term beneficial impacts to tourism and wildlife viewing from this project type "would occur as a result of the improvement of wildlife and aquatic species habitat and associated increases in wildlife and aquatic species populations, diversity and viewing opportunities."

Recreational use would be adversely impacted during construction activities. The impacts are anticipated to be minor and temporary. In turn, restoration of these rookery islands is anticipated to increase the opportunity for bird watching and related tourism. Beneficial economic effects would accrue to local recreational supply retailers, restaurants, and hospitality providers. These economic benefits would be concentrated in the service and retail industry sectors. The project should result in beneficial impacts to tourism and recreational uses over the long-term.

Long-term beneficial impacts would be enhancement of waterbird populations locally, regionally, and Gulf-wide. Birds are an important component that supports nature based tourism. Galveston Bay is recognized internationally for the diversity and abundance of birds that depend on the system as part of their life cycles. Waterbirds play a significant role and support significant revenue associated with nature tourism. Texas ranks second in the nation for wildlife viewing impact and 16% of the national impact occurs in the Gulf of Mexico (USFWS 2013a).

5.2.5.3.4 Public Health and Safety

Affected Resources

Galveston Bay is used by commercial fisheries, industrial, and recreational users. Recreational angling is primarily conducted from boats for areas near the potential sites. Efforts would be made to avoid or minimize impacts to public boat launch facilities. Appropriate signage and buoy markers at the site and at boat ramps would be displayed. Postings in local media would also take place to ensure that efforts are made to inform recreational users. Due to the potential increased small boat traffic (construction related) in the area, appropriate safety measures would be employed to ensure that water related accidents and conflicts are minimized. In addition to signage and buoys during the construction period, the breakwaters and or shoreline armoring of each island would be permanently marked with signs and markers including possible radar reflectors, as determined through consultation with appropriate navigation entities.

Restoration and protection of the Galveston Bay rookery islands are not anticipated to generate hazardous waste or the need for disposal of hazardous waste. All occupational and marine safety regulations and laws would be followed to ensure safety of all workers and monitors. The project deployment would use mechanical equipment and marine vessels that use oil, lubricants, and fuels. These are rookery islands, uninhabited by humans, and only the islands would be impacted by erosion.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of the Galveston Bay rookery islands would not be constructed and no impacts to public health and safety would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.4.9 and 6.7.15 of the Final Phase III ERP/PEIS describe the impacts to public health and safety, including flood and shoreline protection from early restoration projects types, including restore and protect birds. For these islands, impacts to public health and safety and shoreline protection were analyzed adequately within the PEIS. The PEIS determined that "project types involving construction and construction activities could result in short-term minor adverse impacts to public health and safety as a result of the operation of heavy equipment and construction materials. In addition, if hazardous chemicals or other materials are unintentionally released into the environment, soils, groundwater, and surface waters would be adversely impacted. Similarly, construction projects involving the use of boats and barges, and associated equipment, for the placement of materials to create habitat could impact the public through construction activities and the potential to contaminate surface waters, resulting in short-term minor adverse impacts."

Due to the nature and location of the Galveston Bay rookery islands, no impacts to public health and safety are anticipated as a result of project implementation. All hazardous materials handled during construction would be contained and appropriate barriers would be in place to ensure the protection of adjacent water resources from potential spills and leaks. In the event of a discharge of oil or release of hazardous substances, the release would be reported to the National Response Center (800-424-8802) and Texas Emergency Oil Spill and Hazardous Substance Reporting line (800-832-8224) as required. BMPs in accordance with Occupational Safety and Health Administration and state and local requirements would be incorporated into construction activities on site to ensure the proper handling, storage, transport and disposal of all hazardous substances. Personal protective equipment would be required for all construction personnel and authorized access zones would be established at the perimeter of the worksite during construction. Due to the potential increase in small boat traffic (construction related) in the area, appropriate safety measures would be employed to ensure water related accidents and conflicts are minimized. No adverse effects to public health and safety are expected as a result of this project.

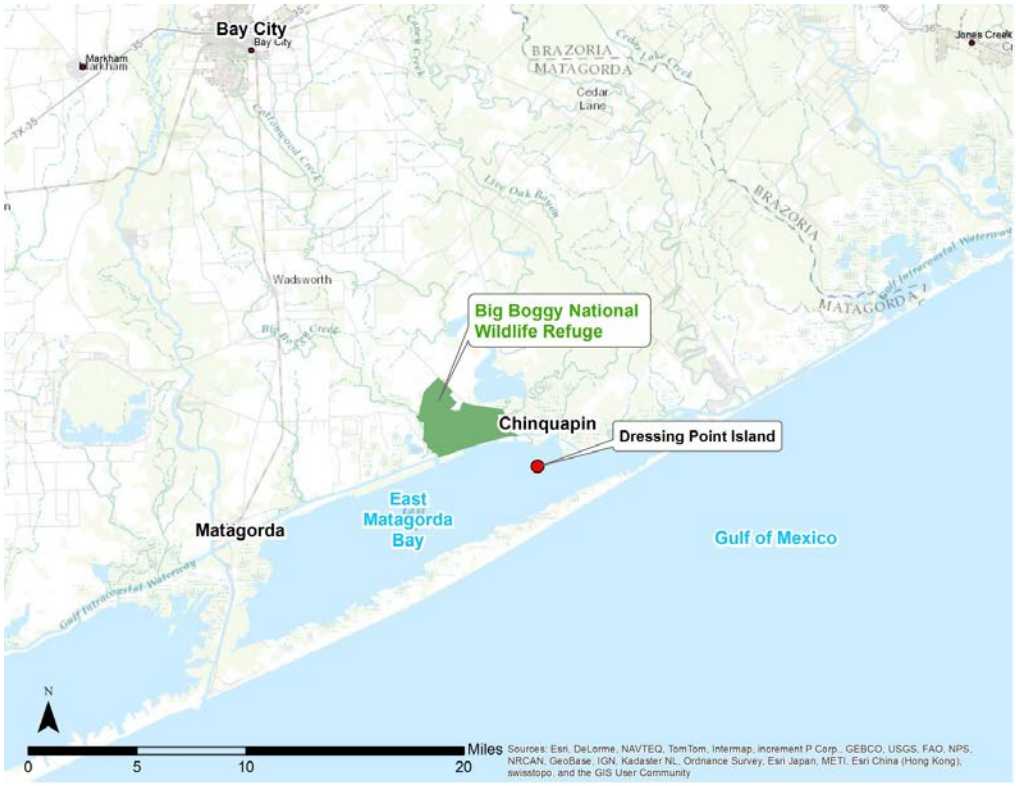
5.2.6 East Matagorda Bay Rookery Island

This section provides the background and description for the proposed actions in East Matagorda Bay, which includes the restoration and protection of Dressing Point Island. The location, scope, construction and installation, as well as operations and maintenance for Dressing Point Island are discussed in the following subsections.

5.2.6.1 East Matagorda Bay Rookery Island Location

Dressing Point Island is located in East Matagorda Bay, Matagorda County, Texas at 28.731386˚ N, 95.7606712˚ W; NAD83. It is part of the Big Boggy National Wildlife Refuge and is located 8 miles east of the community of Matagorda and 21 miles southeast of Bay City (Figure 5-11). The area that may be directly or indirectly affected is about 56 acres and includes the footprints of the construction and staging areas around the island, breakwater/levee, vegetation plantings, earthen fill, and shell knoll. The borrow area is not included in this footprint estimate because it has not yet been identified. Materials for the construction activities would need to be transported via roads and via marine waterways. Existing transportation networks and navigational channels would be utilized as much as possible. Large-scale equipment and supplies may enter East Matagorda Bay via the GIWW. Small boats could enter the bay via boat ramps from the community of Chinquapin, approximately 1.5 miles from Dressing Point Island.

Figure 5-11. Location of Dressing Point Island



5.2.6.2 East Matagorda Bay Rookery Island Project Scope

The proposed island restoration is located on submerged and emergent land. Appropriate lease(s) or modifications to existing leases would be obtained prior to implementing the proposed restoration actions. The preliminary design for the restoration and protection of the island, which is nearly completed, includes several components that would improve nesting habitat on the island and increase its longevity. The conceptual plan is shown in Figure 5-6 and contains the following elements:

- Construct 5 island acres by placing clean fill over submerged land;
- Place fill on 2 acres of existing island to raise elevation
- Construct 5,000 feet of breakwater to protect the restored and existing island;
- Raise the elevation of an existing shell knoll to build 0.35 acres emergent shell hash; and
- Plant 7 island acres with native scrub-shrub vegetation.

A potential component of the restoration and protection of Dressing Point Island includes a constructed marsh located adjacent to the breakwater. Should dredging be required to provide access for vessels during construction, the project design would allow for the beneficial use of dredge material, using BMPs, to backfill the channel and use any excess material to create intertidal marsh. The decision to construct the marsh would be made by the Implementing Trustees for the Texas Rookery Islands project and only after it has been determined that there are enough remaining material or funds available from the funding provided for the Texas Rookery Islands project.

5.2.6.3 East Matagorda Bay Rookery Island Construction and Installation

Preliminary engineering has been completed for Dressing Point Island. Refined design and construction specification packages for the island would be developed by PE(s) with coastal restoration experience. Construction and implementation strategies would be similar for each rookery island. Throughout the design process, every practical attempt would be made to avoid and minimize potentially adverse environmental and cultural impacts. The following descriptions for each of the island construction elements are preliminary and based on current planning efforts and resource agency experience with similar projects and should be considered typical. Additional details describing the island construction methods can be found in Section 5.2.4.3.

In general, construction would require the use of barges, small watercraft, large track hoe excavators, earth moving equipment, hydraulic or clamshell dredges, and a dockside staging area. Equipment and materials for the construction activities would be transported via roads and marine waterways. Since water depths are shallow, temporary barge access channels may be needed to access the site. These channels would be backfilled upon completion of construction activities. Material would be transported to construction areas on deck barges (or similar, appropriate vessels). The weight loaded onto the deck barges would be based upon the depth of the waterway to minimize adverse impacts to the bay bottom. Smaller vessels that would need to use the channel or access canal could be used to bring in supplies and people. Impacts to submerged habitat would be minimized by limiting the use of spuds on the barge or tugs and limiting the use of a track-hoe (or similar equipment) to position and move the barge.

5.2.6.3.1 Island Fill

The maximum amount of earthen fill material estimated for Dressing Point Island is 70,000 cubic yards. To date, the source of the fill material has not been identified for Dressing Point Island. Additional details describing the island fill construction methods can be found in Section 5.2.4.3.1.

5.2.6.3.2 Breakwater

Breakwaters would be constructed to dampen wave energy and to help prevent erosion. A containment berm or other structure/method could also be used for containment and dewatering of the fill material. Graded stone, typically limestone, would be used to construct the breakwaters. Physical data from the site would be evaluated by a qualified coastal PE and the project team prior to selection of design. The amount, grading, and size of rock used would be dependent on several factors determined in the final

design. The project team would include individuals from TPWD, USFWS, and participating partners. Additional details describing the breakwater construction methods can be found in Section 5.2.4.3.2.

5.2.6.3.3 Vegetation Planting

Once the earthen fill has dewatered and sediments have settled, areas with raised elevations on the restore island (about 7 acres) would be planted with native scrub-shrub vegetation to help promote desired vegetation establishment. Plants used would be species documented from similar island sites and be propagated from stock located on the Texas coast. Species under consideration include, but are not limited to, those shown in Table 5- 2 in Section 5.2.4.3.4. Additionally, marsh plantings, if required, would include smooth cordgrass (*Spartina alterniflora*) and marshhay cordgrass (*Spartina patens*). A Vegetation Planting Plan modified from and based on the NRCS Publication NRCS-TX-612 would be developed prior to implementation (NRCS 2013). This plan would provide specifications for the species of native vegetation to be used; acceptable source stock; planting densities and locations on the island for planting; survival targets and adaptive management strategies. Expected plant survival is approximately 60% at the end of the 5-year monitoring period. Protective measures may include trunk collars or wire exclusion cages to protect saplings from herbivory or trampling during the first few years after planting. Time of year as well as substrate salinity would determine the timing for planting. It is anticipated that this would take place approximately one year after construction, depending on environmental conditions.

5.2.6.3.4 Shell Knoll Enhancement

To enhance habitat for bare ground nesting birds near the island, shell material would be placed and integrated with the existing shell knoll (emergent shell substrate) southwest of the island. Approximately 2,500 cubic yards of shell material similar to the shell hash present in structure, form, and mineral composition (calcareous) would be placed on the knoll. This added material would raise the elevation to support ground nesting species of colonial waterbirds. It would also provide a small wave break and protect a portion of the island from wave induced erosion.

5.2.6.3.5 Construction Schedule

Dressing Point Island is currently used for nesting by waterbirds. Therefore, construction activities would avoid the nesting season, which is usually February 1 through August 15. However, some field activities that pose minimal disturbance to nesting birds may be acceptable during this time. Any such activities would be coordinated with state and federal agency biologists and with NGO partners prior to initiation of field work. The final engineering and design for the island is estimated to be completed in 18 months. Activities associated with construction are not expected to take longer than 6 months. The timing of contracting awards and weather conditions could impact the construction schedule.

5.2.6.4 East Matagorda Bay Rookery Island Operations and Maintenance

Dressing Point Island is part of the Big Boggy National Wildlife Refuge. It was donated and added to the refuge system in 1988, and is now part of the USFWS' Texas Mid-Coast Refuge Complex. The island is an uninhabited and not open to the public but open water areas of the bay are used for commercial or recreational activities such as paddling, fishing, wildlife viewing, or transportation. As part of the Big Boggy National Wildlife Refuge, maintenance activities on Dressing Point Island would continue to be managed by the USFWS. Annual surveys colonial waterbirds surveys are conducted and submitted for collection. Routine assessment of the island is made by refuge biologists and managers. Once construction specifications and deliverables have been achieved, routine management would be the responsibility of refuge personnel.

5.2.7 East Matagorda Bay Rookery Island Affected Environment and Environmental Consequences

This section provides the affected environment and environmental consequences for the proposed actions in East Matagorda Bay, which includes the restoration and protection of Dressing Point Island.

According to the CEQ Regulations for Implementing NEPA (§§ 1502.1 and 1502.2) agencies should "focus on significant environmental issues" and for other than significant issues there should be "only enough discussion to show why more study is not warranted." After preliminary investigation, some resource areas were determined to be either unaffected or minimally affected by the proposed action. These resources are not discussed in further detail below. Only those resource areas with potential, adverse impacts are discussed in detail below.

The programmatic analysis looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resource areas that are not expected to be adversely impacted are not evaluated further under given proposed actions. Resource areas that are not analyzed in detail are listed below with a brief rationale for non-inclusion:

- Socioeconomics/Environmental Justice: Dressing Point Island is not open to the public but open water areas of the bay are used for commercial or recreational activities such as paddling, fishing, wildlife viewing, or transportation. Short-term beneficial impacts to the local and regional economies would occur from increases in construction jobs and demand for workforce to support the restoration project. These jobs would provide income, sales, and downstream economic activity in the region. Any non-local workers, brought in for a short period of time, would bring in additional spending as workers stay in local hotels and eat in local eating and drinking establishments. Project spending would include and contribute to support of the workforce needed to design, engineer, manage, and carry out the projects. Additionally, locally purchased (or rented) equipment and materials would also benefit regional economies.

The Trustees find that the rookery island does not meet any of the criteria for determining that disproportionately high and adverse effects would likely fall on minority or low-income populations. In addition, the island is uninhabited by humans and restoration of the island would not be directly affecting any residents. Furthermore, there are no adverse effects to low income or minority populations anticipated from the proposed action.

- Infrastructure: The nearest pipeline is over 3 miles from Dressing Point Island. The proposed action is anticipated to have no impact to infrastructure, since new infrastructure would not be built and existing infrastructure in the area would be avoided.

- Land and Marine Management: Dressing Point Island lies within the Big Boggy National Wildlife Refuge boundary. It is an uninhabited island that is not open to the public and managed by USFWS staff working on the Texas Mid-Coast Refuge Complex. The island includes submerged bay bottom in its construction footprint. The appropriate lease(s) or modifications to existing leases would be obtained prior to construction. The proposed action is anticipated to have no impact to land and marine management, since projects would be consistent with the prevailing management, practices, plans, and direction governing the use of the areas where the island restoration would take place.

- Land and Marine Transportation: The proposed action is anticipated to have no impact to land and marine transportation. Shipping routes would need to be properly identified prior to the selection of borrow sites for dredge and fill material to prevent any impacts to marine transportation. Activities related to construction would require coordination with the users of the waterway. It is expected that activities would not interrupt the channel traffic to any significant degree. Most of the commercial traffic takes place on a routine schedule and construction activities would be timed to reduce any interference with commercial operators.

5.2.7.1 Physical Environment

The description of the physical environment of East Matagorda Bay is divided into geology and substrates, hydrology and water quality, air quality and greenhouse gas emissions, as well as noise characteristics of the area.

5.2.7.1.1 Geology and Substrates

Affected Resources

East Matagorda Bay consists of very poorly drained, nearly level, clayey, saline soils. These soils have weakly convex relief and a water table at or near the surface. The relief is broken by standing ponds of water, small bayous, and small drains. This map unit is in coastal marshes and is commonly flooded. The soils are underlain by clayey and loamy sediments. These soils are poorly suited to uses other than

wildlife habitat because of wetness, the hazard of flooding, salinity, and the clayey texture (U.S. Department of Agriculture 2001).

Dressing Point Island

Dressing Point Island is a natural island formed from the erosion of Dressing Point Peninsula (NOAA 1891 and 1909). According to the Matagorda County Soils Survey, the island and surrounding area are classified as either water or beaches. Beaches are low in elevation, frequently flooded, and slopes average less than 0.5 percent. The submerged lands surrounding the island are comprised of mud bottom, scattered shell, reef, and seagrasses. The scattered shell and seagrasses in the area are transient. Therefore, updated surveys would be conducted prior to construction to identify seagrasses and exact locations of reef boundaries that contain live oysters. Final designs would be modified to minimize impacts to seagrasses, productive reef, and scattered shell areas.

Borrow Area

Fill material may be obtained from an *in situ* borrow area, a more distant area (which could include an upland site), or from a project that would be dredging materials and is looking for beneficial use of dredged material. Borrow sites determined to be suitable would be evaluated for environmental conditions to ensure that cultural and/or sensitive resources are properly addressed. Location of a specific borrow site(s) would be based on several factors including the absence of sensitive resources (e.g. oyster reef or other hard bottom substrate), geotechnical and sediment quality, nearby commercial and/or recreational activities, and lateral extent of available material (avoiding a deep borrow site). See Section 5.2.4.3.1 for additional details on the borrow area.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of Dressing Point Island would not be constructed and no impacts to geology and substrates would occur. However, the beneficial impacts from implementation of this project would not be realized, resulting in adverse impacts to the rookery island as it would continue to erode and lose elevation. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.1 and 6.7.1.1 of the Final Phase III ERP/PEIS describe the impacts to geology and substrates from early restoration projects intended to restore and protect birds.

Restoration and enhancement of Dressing Point Island would affect substrates at the placement and borrow sites. Substrates within the footprint of the project would be affected through the placement of clean fill and hard, structural material. Restoration and protection of Dressing Point Island would have

minor impact on substrates and geology. Adverse impacts would be minor and local. Long-term benefits would occur to the bottom substrates due to stabilization of sediments protection from erosion.

Mitigation measures to minimize adverse impacts to geology and substrates could include:

- Employment of standard BMPs for construction to reduce erosion and loss of sediments.
- Evaluations of potential borrow sites for environmental conditions as well as cultural and sensitive resources concerns.
- Selection of a borrow site with an optimal footprint and sediment accretion to minimize impacts and expedite rate of recovery at the borrow site.

5.2.7.1.2 Hydrology and Water Quality

Affected Resources

The depths surrounding the island are relatively shallow ranging to a depth of approximately 3 feet in the surrounding area. The hydrology of the area is affected by tidal actions and by freshwater inflows. The GIWW and Caney Creek are the major sources of inflow into the bay. The island is a remnant of an old peninsula projecting off the northeastern boundary of the bay. Over time, wind-driven waves have caused erosion, and converted this peninsula into an isolated nesting island, which has resulted in the existing colonial waterbird nesting island.

Water Quality

In general, water quality in East Matagorda Bay is good but over the past years (due to low rainfall) salinities have risen in the bay. There are no consumption advisories (http://www.dshs.state.tx.us/seafood/Survey.shtm#advisory).

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of Dressing Point Island would not be constructed and no impacts to hydrology and water quality would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.2 and 6.7.2.1 of the Final Phase III ERP/PEIS describe the impacts to hydrology and water quality from early restoration projects intended to restore and protect birds. For this island, impacts to hydrology and water quality were analyzed adequately within the PEIS. The PEIS determined that "Creating and enhancing bird nesting and foraging habitat through construction of barrier islands, beaches, and wetlands could result in shoreline stabilization that reduces erosion and reduces adverse

impacts to water quality. These would be long-term beneficial effects because they would extend beyond the construction period. Some short-term adverse impacts due to turbidity could occur in the immediate vicinity of the work area. These effects would be minor and short-term as turbidity would dissipate shortly after placement activities are completed."

No impacts to floodplains or hydrology would occur. Temporary, local, and minor impacts to water quality would result from increased turbidity during dredging activities and placement of fill material. Long-term benefits would also occur from the breakwater/armored levee protection of the island.

Measures to control turbidity and sediment movement would be in place to ensure water quality standards are met and sensitive resources are not affected. These measures may include appropriate water control structures to decant water, as well as the installation of silt fences, hay bales, filter-fabric, and/or temporary levees to control sediments and avoid negative impacts associated with the fill placement.

Air Quality and Greenhouse Gas Emissions

Affected Resources

Air Quality

Dressing Point Island is located in Matagorda County, which is not listed as a nonattainment area for any pollutant by the EPA.

Greenhouse Gas (GHG) Emissions

GHGs are chemical compounds found in the Earth's atmosphere that absorb and trap infrared radiation as heat. Global atmospheric GHG concentrations are a product of continuous emission (release) and removal (storage) of GHGs over time. In the natural environment, this release and storage is largely cyclical. For instance, through the process of photosynthesis, plants capture atmospheric carbon as they grow and store it in the form of sugars. Human activities such as deforestation, soil disturbance, and burning of fossil fuels disrupt the natural cycle by increasing the GHG emission rate over the storage rate, which results in a net increase of GHGs in the atmosphere. The principal GHGs emitted to the atmosphere through human activities are CO2, methane, nitrous oxide, and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, with CO2 accounting for the largest quantity GHG emitted.

Criteria air pollutants and GH emissions are largely generated by electricity production, vehicular movements, and commercial and residential buildings using electricity. GHG emissions would result from both the implementation and operation of the proposed project from the use of vessels during construction and monitoring activities. Engine exhaust from barges, boats, excavators, and equipment would contribute to an increase in GHG emissions. BMPs would be employed to reduce the release of GHG during project implementation.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of Dressing Point Island would not be constructed and no impacts to air quality and GHGs would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.3 and 6.7.3.1 of the Final Phase III ERP/PEIS describe the impacts to air quality and greenhouse gas emissions from early restoration projects intended to restore and protect birds. For this island, impacts to air quality and greenhouse gas emissions were analyzed adequately within the PEIS. The PEIS determined that "During dredging, excavation or placement of materials to restore or enhance beaches, barrier islands and wetlands for bird habitat there could be short-term minor to moderate adverse impacts to air quality from the use of heavy equipment and vehicles. The severity of impacts would be highly dependent on the length and type of construction required and the location of the project. The use of gasoline and diesel-powered construction vehicles and equipment could contribute to a short-term and minor increase in GHG emissions."

Project implementation would require the use of equipment which would temporarily affect air quality in the project vicinity due to construction vehicle emissions. Excavation associated with construction of portions of the improvements may produce fine particulate matter; however, sediments deposited would be mixed with water, keeping airborne particles to a minimum. Adverse impacts to air quality would be minor, local, and temporary, only occurring during active construction activities.

Based on the assumptions described above, and the small-scale and short duration of the construction portion of the project, predicted GHG emissions would be temporary and minor and would not exceed 25,000 metric tons per year, the threshold for triggering additional requirements for GHG emissions.

5.2.7.1.3 Noise

Affected Resources

Instances of increased noise are expected during the construction phases associated with the restoration project. The proposed project would generate construction noise associated with equipment during placement of the fill material, grading, and dredging. Construction equipment noise is known to disturb fish, marine mammals and nesting shorebirds. The timing of noise producing activities would be planned to minimize disturbance to nesting birds. The majority of construction activities would occur outside of the nesting season. Construction noise would also create a potential nuisance to visitors in areas adjacent to project construction activities. Construction noise would be temporary and the construction period is not anticipated to last more than 6 months.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of Dressing Point Island would not be constructed and no impacts due to noise would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.4 and 6.7.4.1 of the Final Phase III ERP/PEIS describe the impacts caused by noise from early restoration projects intended to restore and protect birds. For this island, impacts caused by noise were analyzed adequately within the PEIS. The PEIS determined that "During the construction period to create or enhance bird habitat, minor to major short-term adverse impacts to ambient noise levels may occur, particularly at barrier islands and beaches where beach re-nourishment activities would take place. The severity of impacts would depend to a large degree on the location of the project, type of equipment, the amount of noise that these activities would generate, and the distance to sensitive receptors such as recreational users or wildlife. Impacts on noise would be short-term during the construction period."

The proposed Dressing Point Island restoration would create a minor, localized, and temporary increase in noise.

5.2.7.2 Biological Environment

The biological environment is divided into two sections: living coastal and marine resources, and protected species.

5.2.7.2.1 Living Coastal and Marine Resources

Affected Resources

The submerged lands surrounding Dressing Point Island are comprised of clay, silt and sand bottom, scattered shell, reef, and/or seagrasses. Although past surveys have been conducted in the project area, seagrasses are transient and may not be present every year. Updated seagrass surveys would occur prior to construction. Exact locations of reef boundaries would be identified prior to construction. Since the scattered shell is not static in location, updated surveys would be conducted prior to construction to identify areas of scattered shell and reef substrate. Final designs would be modified to minimize impacts to seagrasses and reef and scattered shell areas.

Dressing Point Island is mapped as upland (www.fws.gov/wetlands/data/google-earth.html). However, the shoreline of the island has areas that would be considered wetland habitats subject to tidal influence. The TPWD Ecological Systems Classification has identified the habitat types in the Dressing Point Island area to be water, coastal salt and brackish high tidal marsh, coastal salt and brackish high

tidal shrub wetland, and coastal salt and brackish low tidal marsh. The low tidal marsh community is described as marshes frequently inundated by tides and often dominated by smooth cordgrass (*Spartina alterniflora*). Tidal shrub wetland may be dominated by species such as high tide bush (*Iva frutescens*) or eastern baccharis (*Baccharis halmifolia*). The high tidal marsh is irregularly flooded marsh dominated by graminoids such as marshhay cordgrass (*Spartina patens*), saltgrass (*Distichlis spicata*), and Gulf coast muhly (*Mulhlenbergia capillaris*). Some shoreline areas contain shell hash berms.

There are a number of aquatic species found in the island restoration areas. Fish species include sand seatrout, spotted or speckled seatrout, red drum, tonguefish, flounders, Atlantic bumper, and porgys. Benthic organisms include bivalves, gastropods and other mollusks, amphipods, annelids, and brown and white shrimp.

Significant avian use of Dressing Point Island takes place today. While nesting activity of colonial waterbirds has declined over the last four decades, the island maintains its relative importance with other nesting sites along the Texas coast. During the non-breeding season birds use the island as staging, loafing, and roosting areas. The American oystercatcher and the eastern willet, non-colonial nesting species, may use the island for nesting. Water dependent birds may use the open bay to forage and roost. These would include loons, bay ducks, gulls and terns, and pelicans. Non-avian terrestrial wildlife has not been observed at the island site. Texas diamondback terrapins may use Dressing Point Island and surrounding waters.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of Dressing Point Island would not be constructed and no impacts to living coastal and marine resources would occur. However, the beneficial impacts from implementation of this project would not be realized, resulting in the continued degradation of the nesting habitat and adverse impacts to colonial waterbirds. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.5, 6.3.8.6, 6.7.5, and 6.76 of the Final Phase III ERP/PEIS describe the impacts to habitats and living coastal and marine resources from early restoration projects intended to restore and protect birds. The PEIS determined that “Creating and enhancing bird habitat would create long-term benefits from increasing stability and resiliency of barrier islands and beaches.”

The PEIS also found that “some short-term adverse impacts could occur from dredging and other borrowing techniques which result in suspended sediments and increased near-site turbidity.” Adverse effects from dredging may include:

- Dredged sediment removed from the bay bottom could impact local benthic organisms on or near the borrow site from increased turbidity, substrate disturbances or siltation, which could locally increase mortality and inhibit activities in the short-term until the site recovered.
- Increased turbidity could limit available light necessary for photosynthesis, and disruption in the water column and surface water could disturb some pelagic microfaunal communities. These impacts would be short-term and minor because pelagic microfaunal communities would re-establish once the turbidity dissipates.
- Fish present in the dredging area could be subject to a temporary increase in sound pressure levels, a decrease in water quality, entrainment in dredge sediments, and removal of benthos from dredged areas. Sound pressure level increases or entrainment could result in mortality of individual finfish. This would be a minor short-term adverse effect that would not be expected to reduce local fish populations.
- Birds using the sites as roosting and/or loafing areas would be forced to other parts of the island or other surrounding areas during construction activities. This would be temporary, however, and once the project was completed, the project would have long-term benefits to birds for these uses.
- Any breeding birds using the islands would be avoided by restricting construction to the non-nesting period.

Dredging from a direct dredge aquatic borrow site would change substrate topography, indirectly impacting benthic and other aquatic organisms using this habitat. Depending on the depth-of-cut, dredging could result in low dissolved oxygen in bottom waters. The depth-of-cut is planned to be as shallow as is feasible. This project would likely result in short-term minor adverse impacts due to construction and dredging-related disturbances and small changes to sessile species populations if present. However, there would likely be no impact to feeding, reproduction, or other factors affecting population levels. Short-term, localized minor impacts to fish and wildlife resources would occur during the construction phase of the project. Mobile aquatic animals including birds would be expected to move away from the fill and borrow sites during construction and return following completion of construction. Isolated, short-term effects on pelagic fish eggs and larvae in the immediate area may occur. Sessile and other limited movement species, especially those buried/burrowed in the substrate could be injured or killed by the dredging activity and the placement of the fill material at the island. However, these types of species are typically numerous and recolonize quickly. Any adverse impacts to marine and estuarine fauna (fish, shell beds, benthic organisms) are expected to be temporary, localized, and minor as those species that would be affected are likely numerous in the area.

The potentially impacted areas, including the borrow area and island construction areas, would be surveyed prior to construction for the presence of sensitive resources. Areas where seagrasses are encountered during the surveys would be documented and measures would be taken to avoid and

minimize any impacts. Construction activities would be designed and coordinated to avoid any impacts to significant reef resources including hard shell substrate in the construction area that is not dominated by the eastern oyster. BMPs would be used to avoid and minimize potential impacts to this hard substrate and may include alternative construction methods as appropriate. Any impacts incurred after avoidance and minimization measures are taken would be fully compensated by creating additional hard shell substrate habitat.

Some of the shoreline area considered wetland habitats subject to tidal influence would be impacted by placement of fill material. However, the shoreline length of the island would increase from what it is today. The new shoreline areas would be gradually slopped into the water creating sufficient tidal fringe to support wetlands. The breakwater would also protect both existing and created shoreline from erosion and reduce wetland loss from erosion.

The project would provide benefits to marine species by providing additional structural fish habitat and increased hard substrate available for estuarine organisms. Over the life of the project, the quality of aquatic habitat would increase. The construction of an intertidal or subtidal breakwater or armored levee would provide long-term benefits to marine species by providing additional hard structure (including crevices and interstitial voids) habitat. Additionally, reducing energy within the breakwater area should benefit seagrass populations in the area by reducing turbidity and wave energy.

Construction activities would cause temporary impacts to wildlife due to the presence of people and use of heavy equipment on the island. These impacts would last for the duration of construction, which is estimated to be a maximum of 6 months. Permanent impacts result from alterations to the island and supported habitat would provide long-term benefit to nesting birds. Natural colonization would occur which would provide grassy substrate in addition to the vegetative plantings of scrub-shrub vegetation, both of which could be used by the colonial nesting birds.

To prevent invasive exotic species from inhibiting nesting activities the islands would be monitored for the presence of undesirable exotic species. If they negatively impact nesting activities, appropriate treatment methods would be used to remove them.

5.2.7.2.2 Protected Species

Protected species and their habitats include ESA-listed species and designated critical habitats, which are regulated by either the USFWS or the NMFS. Protected species and habitat also include marine mammals protected under the Marine Mammal Protection Act, essential fish habitat (EFH) protected under the Magnuson-Stevens Fishery Conservation and Management Act, migratory birds protected under the Migratory Bird Treaty Act and eagles protected under the Bald and Golden Eagle Protection Act.

Affected Resources

Threatened or Endangered Species

Five species of endangered or threatened species of sea turtles were identified as possibly being present in the project area: loggerhead, green, hawksbill, leatherback, and Kemp's ridley sea turtles. Sea turtles nest on beaches, and most species use nearshore hard bottom reef complexes, shallow water habitat (including seagrasses), or other coastal areas with rocky bottoms to forage for food. This area has not been designated as critical habitat for any of the sea turtle species. Sea turtle nesting activities are not expected to occur here since there is no beach habitat; however, sea turtles could be encountered in the open water.

Although highly unlikely, the West Indian Manatee could be found in East Matagorda Bay. The manatee feeds on vegetation, is slow moving, and somewhat intolerant of cold water temperatures. There is the possibility that it may be present during construction activities.

Four species of threatened or endangered bird species are identified as possibly occurring in the vicinity of the project activities: northern aplomado falcon, piping plover, red knot, and whooping crane. The proposed island site is not located within critical habitat for any of these species. The northern aplomado falcon could be present any time of year and whooping cranes could be present anytime during late fall through early spring. There is no habitat for the northern aplomado falcon or whooping crane at Dressing Point Island and within East Matagorda Bay waters. However, there is habitat on the mainland north of the bay and on Matagorda Island. If placement areas or upland borrow sites are used, there is a small probability that these species could be present using the area to forage. The whooping crane has been documented at Big Boggy NWR on the mainland and could possibly be present there anytime during late fall through early spring. It is unlikely that the whooping crane would use Dressing Point Island for any of its habitat needs. The piping plover is a migrant and winter resident on the Texas coast and occurs in Matagorda County. However, there are no documented records of piping plovers on Dressing Point Island. Piping plovers are not expected to occur in the construction area because typical habitats, beach and bayside tidal flat habitats, for the species do not exist. The red knot is primarily migratory in Matagorda County. However, there are no documented records of red knots on Dressing Point Island. Red knots are not expected to occur in the construction area because typical habitats, beach and bayside tidal flat habitat, for the species is not present.

Essential Fish Habitat (EFH)

EFH in the project's area of effect is identified and described for various life stages of 13 managed fish and shellfish (Gulf of Mexico Fisheries Management Council 2005). Dressing Point Island is located in an area that is designated as EFH under the Magnuson-Stevens Fishery Conservation and Management Act for several species of shark, shrimp, coastal migratory pelagic species, and reef fish (Table 5-7 and Table 5-8). No Habitat Areas of Particular Concern or EFH Areas Protected from Fishing were identified at the project location.

Table 5-7. EFH for estuarine habitats within the vicinity of Dressing Point Island proposed area of effect

Species Common Name	Eggs	Larvae	Post Larvae	Early Juvenile	Late Juvenile	Adult	Spawning Adult
Estuarine Emergent Marsh							
Red Drum			●	●	•	●	
Gray Snapper						●	
Brown Shrimp				●			
White Shrimp				●			
Estuarine Oyster Reef							
Brown Shrimp				●			
Estuarine Sand and Shell Bottom							
Red Drum			●		•	●	
Gray Snapper						●	
Lane Snapper				●	●		
Brown Shrimp				●			
Estuarine Mud/Soft Bottom							
Red Drum		●	●	●	•	●	
Gray Snapper						●	
Lane Snapper				●	●		
Brown Shrimp				●			
White Shrimp				●			

(● indicates habitat type designated as EFH for species' life stage)

Table 5-8. Highly migratory species EFH designations within the proposed area of effect

Species Common Name	Life Stage Within Estuarine Waters
Scalloped Hammerhead Shark	Neonate & Juvenile
Blacktip Shark	Neonate, Juvenile & Adult
Bull Shark	Neonate, Juvenile & Adult
Lemon Shark	Juvenile
Spinner Shark	Neonate & Juvenile
Bonnethead Shark	Neonate, Juvenile & Adult
Atlantic Sharpnose Shark	Neonate, Juvenile & Adult
Finetooth Shark	Neonate

Marine Mammals

The bottlenose dolphin and the West Indian Manatee (manatees are listed and protected under the Endangered Species Act) are the only marine mammals known to occur in East Matagorda Bay. Manatees are extremely rare in Texas waters with sightings less than one per year on average across the

entire Texas coast. Due to the relatively shallow depth of the surrounding areas of the island and the established ranges and depths that the majority of the cetaceans occupy, additional marine mammals would not be expected to enter the construction area.

Bald and Golden Eagles

There may be eagle home ranges or established territories that would include the rookery island site, but no eagles are nesting within 660 feet of the island. Golden eagles near the coast would be an extremely rare occurrence.

Migratory Birds

Dressing Point Island is an important site for migratory birds. It currently supports multiple species of nesting colonial waterbirds (Table 5-9). It also supports non-colonial nesting by the American oystercatcher and eastern willet. The island is used to support development of fledged young until they are able to support themselves in foraging habitats in adjacent bay habitats. Water dependent birds may use the open bay to forage and roost. These would include loons, bay ducks, gulls and terns, and pelicans.

Table 5-9. Colonial waterbird species recorded nesting at Dressing Point Island

Common Name	Scientific Name
Brown Pelican	*Pelicanus occidentalis*
Great Egret	*Ardea alba*
Great Blue Heron	*Ardea herodias*
Snowy Egret	*Egretta thula*
Little Blue Heron	*Egretta caerulea*
Tricolored Heron	*Egretta tricolor*
Reddish Egret	*Egretta rufescens*
Cattle Egret	*Bubulcus ibis*
Black-crowned Night Heron	*Nycticorax nycticorax*
Roseate Spoonbill	*Platalea ajaja*
White Ibis	*Eudocimus albus*
White-faced Ibis	*Plegadis chihi*
Laughing Gull	*Leucophaeus atricilla*
Caspian Tern	*Hydroprogne caspia*
Royal Tern	*Thalasseus maxima*
Forster's Tern	*Sterna forsteri*
Black Skimmer	*Rynchops niger*

For non-breeding migratory birds the island and surrounding waters currently supports roosting and foraging use. The different bird taxonomic guilds and types of use are listed below:

Loons and Grebes – This group of birds may use surrounding waters during the fall, winter, and spring to forage. Presence in the area would be based on available forage fish and invertebrates. Construction activities may cause the birds to move out of nearby foraging areas; however, no take is anticipated.

Waterfowl – Waterfowl use of the island is limited. Surrounding bay waters are used by several species of wintering waterfowl, primarily bay ducks. This group may be affected by construction activities. The temporary nature of construction and this bird group's use of other available waters nearby will avoid take.

Pelicans and Cormorants – These would significantly use the existing island for resting, staging and or roosting during the fall, winter and spring. Construction activities would cause the birds using the island to move to other sites. Acclimation to construction activities may take place.

Wading Birds – These heron and egret species may use the existing island to some degree for resting and may use the shallow intertidal zone to feed. This use would be limited. Construction activities may cause the birds to move out of nearby foraging areas; however, no take is anticipated.

Terns and Gulls – These species would use the island site significantly for resting, staging and or roosting. Foraging areas would constantly change depending on the presence of forage fish, currents, etc. and thus may or may not be proximal to the site. These birds would move to other nearby sites in the bay system to use for these purposes.

Shorebirds – Significant numbers of shorebirds migrate through the Texas coast in the fall and spring and these may use the intertidal zone to forage. Several species overwinter as well and may use the intertidal areas of the existing island to forage. Construction activities may limit the use of the island by these birds. There are other sites nearby that would serve similar uses.

The disruptions caused by construction activities would be temporary and once completed the restored island would provide a greater range of habitats available for birds to use. Increased vegetation would improve habitats that are essential for nesting colonial waterbirds and provide a long-term benefit. The proposed actions would support the project goal to increase the number of nesting pairs of colonial waterbirds. The proposed actions would also provide more foraging and resting opportunity for many of the above listed bird groups as well as other guilds during the non-nesting season.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of Dressing Point Island would not be constructed and no impacts to living coastal and marine resources would occur. However, the beneficial impacts from implementation of this project would not be realized, resulting in the continued degradation of the nesting habitat and adverse impacts to colonial waterbirds. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.3.8.5, 6.3.8.6, 6.7.5, and 6.76 of the Final Phase III ERP/PEIS describe the impacts to habitats and living coastal and marine resources from early restoration projects intended to restore and protect birds. The PEIS determined that "Creating and enhancing bird habitat would create long-term benefits from increasing stability and resiliency of barrier islands and beaches."

The PEIS also found that "some short-term adverse impacts could occur from dredging and other borrowing techniques which result in suspended sediments and increased near-site turbidity." Adverse effects from dredging may include:

- Sea turtle and marine mammal individuals may be present in project areas where dredging or underwater use of equipment is occurring. They could be subjected to temporary increased noise, turbidity, and water quality changes. These activities could temporarily displace individuals or prey during construction and could result in short-term, minor impacts. Consultation with appropriate agencies would be required prior to final design and project implementation. Guidelines provided by NOAA and USFWS to avoid and minimize potential impacts to sea turtles or marine mammals will be followed.

- Northern aplomado falcon and whooping crane may be present if an upland borrow site is used. These species, if disturbed, have access to nearby habitat that is within their normal flying distances for daily foraging movement. Any upland site proposed for borrow material would be surveyed for potential use by any of these species. Piping plover and red knot may be present at Dressing Point Island. However, their presence is very unlikely since their preferred habitat is not present at this site.

- Fish present in the dredging area could be subject to a temporary increase in sound pressure levels, a decrease in water quality, entrainment in dredge sediments, and removal of benthos from dredged areas. Sound pressure levels or entrainment could result in mortality of individual finfish. This would be a minor short-term adverse effect that would not be expected to reduce local fish populations or designated EFH. Best management practices to minimize both short-term construction impacts and long-term impacts to sensitive habitats, included in the EFH assessment, will be followed during project implementation.

- Birds that forage in or near the dredge site could be temporarily affected. However, these effects would be short-term and minor as birds would be expected to move away to forage in other readily available foraging habitat during the dredging. Consultation with appropriate agencies would be required prior to final design and project implementation. Specific BMPs would be incorporated to cover all activities associated with the project to ensure that construction activities are planned to avoid individual birds and critical habitat during project activities and that no adverse impacts would occur. If individuals are present and disturbed by the noise, they would have access to nearby habitat that is within their normal flying distances

for daily foraging movement. Upland excavation activities will not occur in habitat used by threatened or endangered species.

- Birds using the sites as roosting and/or loafing areas would be forced to other parts of the island or other surrounding areas during construction activities. This would be temporary, however, and once the project was completed, the project would have long-term benefits to birds for these uses.
- Any breeding birds using the islands would be avoided by restricting construction to the non-nesting period.

Methods used to remove material from the borrow site would be with a cutter head dredge or a clamshell dredge both of which would have minimal impacts to pelagic species. Placement of fill material is a slow process allowing plenty of time for sea turtles to leave the area. Island construction activities are not expected to have impacts to protected marine species and their habitats in the areas where the materials would be placed. Short-term minor impacts may occur if species using the project area are temporarily disturbed and must move to another area. Impacts to wildlife would be avoided via management guidelines and techniques as appropriate; therefore, restoration activities are not likely to adversely affect federally-listed sea turtles. Additionally, the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) and Measures for Reducing Entrapment Risk to Protected Species (NMFS 2012) would be followed. Long-term impacts would be beneficial with the addition of hard substrate that would support a more diverse community of benthic organisms and fish.

NMFS concurred with the EFH assessment for the project, which determined that temporary and permanent impacts would occur to estuarine water column and underlying submerged estuarine soft bottom habitat categorized as EFH under provisions of the Magnuson-Stevens Fishery Conservation and Management Act (NMFS 2015). Project implementation would directly impact estuarine soft bottom EFH to create upland colonial waterbird nesting islands. Both dredging and fill placement locations would be sited to avoid sensitive estuarine habitats such as oyster reefs and seagrasses. Best management practices to minimize both short-term construction impacts and long-term impacts to sensitive habitats will be followed.

The Trustees initiated consultations pursuant to Section 7 of the Endangered Species Act with the NMFS' Protected Resources Division (initiated July 7, 2015) and the USFWS Texas Coastal Ecological Services Field Office (initiated August ?, 2015). The Trustees are coordinating with USFWS to determine if this project requires authorization under the Marine Mammal Protection Act. The Trustees have completed coordination and reviews with NOAA under the Marine Mammal Protection Act. The Trustees have also initiated review of the proposed project for impacts to bald eagles and migratory birds in accordance with the Migratory Bird Treaty Act as well as the Bald and Golden Eagle Protection Act.

Comment [JG2]: Needs to add date when consultation is initiated

Temporary and localized turbidity impacts during dredging and placement of fill for the construction of the island could impact EFH. The restoration of the islands would result in the permanent loss of 5 acres

of submerged bay habitat designated as EFH for federally managed fish species through the filling of existing estuarine water column and the underlying estuarine mud/sand/shell substrates to convert these aquatic areas to uplands suitable for bird nesting. If dredging is required for site access or to obtain fill for island restoration that would also result in EFH impacts. To prevent adverse impacts to oyster reefs, locations proposed for dredging would avoid excavation of oyster reef habitat. Proposed dredge sites would also be located in slightly deeper open water habitat. Impacts to existing soft bottom benthic habitat at these dredging locations would be minor and temporary, as the benthic invertebrate communities would quickly re-establish. The proposed breakwaters would result in the permanent filling of EFH. However, the submerged side slopes of the breakwaters would provide hard substrate with interstitial spaces that would enhance foraging areas for fish as well as provide cover for juvenile fish and substrate for establishment of oyster habitat.

Any adverse impacts to marine and estuarine fauna (fish, shell beds, seagrasses, benthic organisms) are expected to be short in duration and minor as those species that would be affected are likely numerous in the area. The project would provide benefits to marine and estuarine fauna by providing additional structural fish habitat which would compensate for loss of benthic bay bottom habitat. Over the life of the project, the quality of aquatic habitat would increase.

The marine mammals that could use East Matagorda Bay (e.g. dolphins and manatees) would leave the area to avoid the construction activities and/or would generally avoid the area because optimal habitat does not exist. Manatees are extremely rare in Texas waters with sightings less than one per year on average across the entire Texas coast. However, if marine mammals are sighted within 50 feet of the construction area, work would stop until the animals move away from the area of their own volition. Therefore, marine mammals would not be impacted during construction activities and no incidental take of marine mammals is anticipated.

Construction activities would be relatively short-term and occur outside of the nesting season period, and therefore not affect any bird nesting activities. Birds using the site for loafing and resting during the construction window may use existing island features during construction if they become acclimatized to the activities. Birds using the nearby open water for foraging may also be displaced to sites more remote from the island or borrow site. Some minor and temporary displacement of local foraging and roosting birds could occur during planting operations. After completion of the island restoration and protection, disturbance during nesting could occur by recreational users. These can include anglers, boaters, and photographers that could approach too closely or disembark on the island. Signs would be placed on and adjacent to the island making users aware that nesting birds are present (Figure 5-10). Disturbing nests is a violation of the Texas Parks and Wildlife Code and the Migratory Bird Treaty Act. Any mortality to chicks would violate state and federal statutes.

The disruptions caused by construction activities would be temporary and once completed the restored island would provide a greater range of habitats available for birds to use. Increased vegetation would improve habitats that are essential for nesting colonial waterbirds and provide a long-term benefit. The

proposed actions would support the project goal to increase the number of nesting pairs of colonial waterbirds. The proposed actions would also provide more opportunity for many of the above listed bird groups as well as other guilds during the non-nesting season.

5.2.7.3 Human Uses and Socioeconomics

This section includes discussions of cultural resources, aesthetic and visual resources of the region, tourism and recreational use in the area, and a general characterization of public health and safety issues.

5.2.7.3.1 Cultural Resources

Affected Resources

Coordination under Section 106 National Historic Preservation Act has been initiated. However, consultations have not been completed at this time.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of Dressing Point Island would not be constructed and no impacts to cultural resources would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

If any culturally or historically important resources are identified during project preparations or pre-deployment surveys, such areas would be avoided during construction. A complete review of this project under Section 106 of the National Historic Preservation Act is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse effects on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

5.2.7.3.2 Aesthetics and Visual Resources

Affected Resources

The affected environment consists of the construction footprint of the island and the borrow site. The landscape in the vicinity of the proposed island area is characterized by a mosaic of open water, coastline, and small islands. There are no designated protected viewsheds in the vicinity of the island. Equipment and construction activities related to island restoration would be visible.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of Dressing Point Island would not be constructed and no impacts to aesthetics and visual resources would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.4.8 and 6.7.14 of the Final Phase III ERP/PEIS describe the impacts to aesthetics and visual resources from early restoration projects types, including restore and protect birds. For this island, impacts to aesthetics and visual resources were analyzed adequately within the PEIS. The PEIS determined that "project types involving the use of construction equipment, including equipment used for the movement and placement of materials (i.e. barges) and barriers enacted to protect public safety would result in some minor to moderate short-term adverse impacts on aesthetics and visual quality. These impacts result from the presence of equipment, barriers and construction-related dust and emissions. During the construction period, visible impedances would detract from the natural landscape and create visual contrast for observers visiting the project areas. Over the short-term, there would be a change in the viewshed that would be readily apparent and that would attract attention. Although such changes would not dominate the viewshed, they would detract from current user activities or experiences…Restoration, improvement and wetland and habitat creation project types would lead to long-term beneficial impacts from the increased visual character of the landscape occurring from the projects restoring or enhancing areas to their natural conditions and over-time, increasing the scenic quality of the project area."

During construction, there would be temporary, minor adverse aesthetic and visual impacts for recreational boaters and fishermen due to the use of construction equipment in and around the project area. However, there would be a long-term beneficial impact to visual and aesthetic resources once the island restoration is completed.

5.2.7.3.3 Tourism and Recreational Use

Affected Resources

Dressing Point Island is located in East Matagorda Bay and is part of the Big Boggy National Wildlife Refuge in Matagorda County. The island is not open to the public but open water areas of the bay are used for commercial or recreational activities such as paddling, fishing, wildlife viewing, or transportation. In existence since at least the 1940's the small recreational community, Chinquapin, is located north of Dressing Point Island. The community is mostly associated with commercial and recreational fishing along with ranching and farming activities. The area attracts a substantial number of recreational visitors that include fishing, hunting, paddling, and bird/nature watching. The local community considers the rookery island a valuable resource and as an important engine that creates

bird resources important to maintain for tourism. Small boats could put in the water in the community of Matagorda or the community of Chinquapin. Large boats and barges would likely access the bay via the GIWW.

Efforts would be made to avoid or minimize impacts to public boat launch facilities. Appropriate signage and buoys markers at the site and at boat ramps would be displayed. Postings in local media would also take place to ensure that efforts are made to inform recreational users. Due to the potential increased small boat traffic (construction related) in the area, appropriate safety measures would be employed to ensure that water related accidents and conflicts are minimized.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of Dressing Point Island would not be constructed and no impacts to tourism and recreational use would occur. However, the beneficial impacts to tourism and recreational use due to implementation of this project would not be realized. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.4.5 and 6.7.11 of the Final Phase III ERP/PEIS describe the impacts to tourism and recreational use from early restoration projects types, including restore and protect birds. For this island, impacts to tourism and recreational use were analyzed adequately within the PEIS. The PEIS determined that "project types involving the removal and placement of dredged materials, ground or substrate disturbing construction activities as well as restoration activities could result in some short-term minor to moderate adverse impacts to wildlife viewing, short-term minor to moderate adverse impacts to hunting, beach and waterfront visitors, and tourism and short-term minor to moderate adverse impacts to fishing. Impacts to these different resource areas stem from (1) temporary site closures enacted to protect public safety; and (2) construction activities and associated wildlife disturbances. These activities may limit tourism and recreational uses accessibility and opportunities." Long-term beneficial impacts to tourism and wildlife viewing from this restoration project type "would occur as a result of the improvement of wildlife and aquatic species habitat and associated increases in wildlife and aquatic species populations, diversity and viewing opportunities."

Recreational use would be adversely impacted during construction activities. The impacts are anticipated to be minor and temporary. In turn, restoration of this rookery island is anticipated to increase the opportunity for bird watching and related tourism. Beneficial economic effects would accrue to local recreational supply retailers, restaurants, and hospitality providers. These economic benefits would be concentrated in the service and retail industry sectors. The project should result in beneficial impacts to tourism and recreational uses over the long-term.

Long-term beneficial impacts would be enhancement of waterbird populations locally, regionally, and Gulf-wide. Birds are an important component that supports nature based tourism. Waterbirds play a significant role and support significant revenue associated with nature tourism. Texas ranks second in the nation for wildlife viewing impact and 16% of the national impact occurs in the Gulf of Mexico (USFWS 2013a).

5.2.7.3.4 Public Health and Safety

Affected Resources

East Matagorda Bay is used by commercial fisheries, industrial, and recreational users. Recreational angling is significant and is primarily conducted from boats for areas near the potential site. Efforts would be made to avoid or minimize impacts to public boat launch facilities. Appropriate signage and buoys markers at the site and at boat ramps would be displayed. Postings in local media would also take place to ensure that efforts are made to inform recreational users. Due to the potential increased in small boat traffic (construction related) in the area, appropriate safety measures would be employed to ensure that risk to water related accidents and or conflicts are minimized.

Restoration and protection of Dressing Point Island is not anticipated to generate hazardous waste or the need for disposal of hazardous waste. All occupational and marine safety regulations and laws would be followed to ensure safety of all workers and monitors. The project deployment would use mechanical equipment and marine vessels that use oil, lubricants, and fuels. This is a rookery island, uninhabited by humans, and only the island would be impacted by erosion.

Environmental Consequences

No Action

Under the No Action alternative, the proposed enhancements of Dressing Point Island would not be constructed and no impacts to public health and safety would occur. Because no action would take place, no mitigation measures would be necessary.

Proposed Actions

Sections 6.4.9 and 6.7.15 of the Final Phase III ERP/PEIS describe the impacts to public health and safety, including flood and shoreline protection from early restoration projects types, including protect and restore birds. For this island, impacts to public health and safety and shoreline protection were analyzed adequately within the PEIS. The PEIS determined that “project types involving construction and construction activities could result in short-term minor adverse impacts to public health and safety as a result of the operation of heavy equipment and construction materials. In addition, if hazardous chemicals or other materials are unintentionally released into the environment, soils, groundwater, and surface waters would be adversely impacted. Similarly, construction projects involving the use of boats and barges, and associated equipment, for the placement of materials to create habitat could impact

the public through construction activities and the potential to contaminate surface waters, resulting in short-term minor adverse impacts."

Due to the nature and location of Dressing Point Island in East Matagorda Bay, no impacts to public health and safety are anticipated as a result of implementation. All hazardous materials handled during construction would be contained and appropriate barriers would be in place to ensure the protection of adjacent water resources from potential spills and leaks. In the event of a discharge of oil or release of hazardous substances, the release would be reported to the National Response Center (800-424-8802) and Texas Emergency Oil Spill and Hazardous Substance Reporting line (800-832-8224) as required. BMPs in accordance with Occupational Safety and Health Administration and state and local requirements would be incorporated into construction activities on site to ensure the proper handling, storage, transport and disposal of all hazardous substances. Personal protective equipment would be required for all construction personnel and authorized access zones would be established at the perimeter of the worksite during construction. Due to the potential increased in small boat traffic (construction related) in the area, appropriate safety measures would be employed to ensure water related accidents and conflicts are minimized. No adverse effects to public health and safety are expected as a result of this project.

5.2.8 Summary and Next Steps

The Trustees have started coordination and reviews under the Endangered Species Act, Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Coastal Zone Management Act, National Historic Preservation Act, Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and other federal statutes, where appropriate. Implementing Trustees would adopt and are required to implement project-specific mitigation measures (including BMPs) identified in the Final Phase IV Early Restoration Plan and completed consultations/permits. Oversight would be provided by the Implementing Trustees. Trustees would conduct due diligence with regard to ensuring no unanticipated effects to listed species and habitats occur, including ensuring that BMPs are implemented and continue to function as intended.

The Trustees initiated consultations pursuant to Section 7 of the Endangered Species Act with the NMFS' Protected Resources Division (initiated July 7, 2015) and the USFWS Texas Coastal Ecological Services Field Office (initiated August ?, 2015) and await the outcome of that consultation.

Comment [AS3]: Add date when consultation is initiated

The EFH consultation, as specified in the Magnuson-Stevens Fishery Conservation and Management Act, was completed on June 5, 2015 (NMFS 2015). NMFS' Southeast Region's Habitat Conservation Division reviewed and concurred with the Trustees' EFH assessment and the determination for the project that temporary and permanent impacts would occur to estuarine water column and underlying submerged estuarine soft bottom habitat categorized as EFH under provisions of that Act and that project implementation would directly impact estuarine soft bottom EFH to create upland colonial waterbird nesting islands (NMFS 2015). Both dredging and fill placement locations would be sited to avoid

sensitive estuarine habitats such as oyster reefs and seagrasses and best management practices will be followed to minimize both short-term construction impacts and long-term impacts to sensitive habitats..

The Trustees are coordinating with USFWS to determine if this project requires authorization under the Marine Mammal Protection Act. The Trustees have completed coordination and reviews with NOAA under the Marine Mammal Protection Act.

The Trustees have also initiated review of the proposed project for impacts to bald eagles and migratory birds in accordance with the Migratory Bird Treaty Act as well as the Bald and Golden Eagle Protection Act.

Pursuant to the Coastal Zone Management Act, the Federal Trustees submitted a consistency determination for this project to the TGLO on May 21, 2015. On July 10, 2015, the TGLO concurred with the determination that the project would be implemented in a manner consistent with the Texas Coastal Management Program. The TGLO letter does not authorize the use of Coastal Public Land. No work may be conducted or structures placed on State-owned land until, the Trustees have obtained all necessary authorizations, including those required by TGLO and the USACE. Additional consistency review may also be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including incident to these authorization processes.

Pursuant to Section 106 of the National Historic Preservation Act, a complete review of this project is ongoing to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Permitting under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act will be addressed during the engineering and design stage of the islands.

The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. Public comments and Trustee responses are found in Chapter 15.

5.2.9 Overall Summary of the Texas Rookery Islands Project

The NEPA analysis of the environmental consequences suggests that minor adverse impacts to some resource categories and no moderate to major adverse impacts are anticipated to result from implementation of the four Texas Rookery Islands. Restoration and protection of the Texas Rookery Islands would increase the size of available rookery island habitat with the goal of increasing the number of nesting colonial waterbirds.

5.2.9.1 Summary of Impacts to the Physical Environment

Impacts to the physical environment from implementation of the Texas Rookery Islands project would include:

- Minor, adverse and local impacts to geology and substrates within the footprint of the project would be affected through the placement of clean fill and hard, structural material. Minor, adverse and local impacts to geology and substrates would occur at the borrow site as well. Long-term benefits would occur to the bottom substrates due to stabilization of sediments protection from erosion.
- No impacts to floodplains or hydrology would occur. Temporary, local, and minor impacts to water quality would result from increased turbidity during dredging activities and placement of fill material. Long-term benefits would also occur from the breakwater/armored levee protection of the islands.
- Minor short-term adverse impacts to air quality and GHG emissions from the use of construction equipment. Impacts would be localized and last only during the construction period.
- Minor short-term adverse impacts to noise from the use of construction equipment. Impacts would be localized and last only during the construction period.

5.2.9.2 Summary of Impacts to the Biological Environment

Impacts to the biological environment from implementation of the Texas Rookery Islands project would include:

- Seagrasses: Seagrasses would be surveyed prior to construction and avoided so there would be no impacts.
- Benthos, invertebrates and fish: Potential short-term minor adverse effects to benthic organisms, invertebrates, and fish may occur during construction activities due to placement of fill, construction of breakwaters/levees, and noise. Following construction, long-term benefits to marine species by providing additional hard structure (including crevices and interstitial voids) habitat.
- Oysters: Active oyster reefs would be surveyed prior to construction and avoided so there would be no impacts. Following construction, long-term benefits to oyster populations would be provided by reducing erosion and turbidity in nearshore waters.
- EFH: Potential short-term minor adverse effects to EFH could occur due to localized turbidity during dredging and placement of fill. Restoration of the islands and construction of breakwaters/levees would result in the permanent loss of over 20 acres of submerged bay habitat. The submerged side slopes of the breakwaters would provide hard substrate with interstitial spaces that would enhance foraging areas for fish as well as provide cover for juvenile fish and substrate for establishment of oyster habitat.

- Marine mammals: No impacts to marine mammals are expected because they would leave the area to avoid the construction activities and/or would generally avoid the area because optimal habitat does not exist. If present BMPs would be implemented to avoid impacts.

- Terrestrial species: Construction activities would cause temporary, minor adverse impacts to wildlife due to the presence of people and use of heavy equipment on the islands. Construction activities would be relatively short-term and occur outside of the nesting season period, and would therefore not affect any bird nesting activities. Permanent impacts result from alterations to the island and supported habitat would provide long-term benefit to nesting birds.

- Threatened and endangered species:

    - Potential short-term minor adverse impacts to sea turtles during construction. These species are all mobile and expected to avoid the project area during construction.
    - No adverse impacts are expected to the northern aplomado falcon, whooping crane, piping plover, red knot, or eagles. If present, BMPs would be implemented to avoid impacts.

Overall, only minor (or less) adverse impacts are expected to occur to some resources while long-term beneficial impacts to avian resources are expected as a result of this project.

5.2.9.3 Summary of Impacts to Human Uses

Impacts to human uses from implementation of the Texas Rookery Islands project would include:

- Cultural Resources: A complete review of this project under Section 106 of the National Historic Preservation Act is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse effects on historic properties located within the project area.

- Aesthetics and Visual Resources: The proposed action would result in minor, temporary visual impacts during construction. However, there would be a long-term beneficial impact to visual and aesthetic resources once the island restoration is completed.

- Tourism and Recreation: There would be short-term, minor adverse impacts to recreational activities in the area during construction. Following construction, there would be long-term benefits through the enhancement of waterbird populations locally, regionally, and Gulf-wide, which supports nature based tourism.

- Public Health and Safety: There would be no adverse public health and safety.

5.2.10 Cumulative Impacts of the Texas Rookery Islands Project

As discussed in Chapter 4, the CEQ NEPA regulations require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined

as “the impact on the 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” (40 C.F.R. § 1508.7).

The proposed Texas Rookery Islands project cumulative impacts analysis tiers to the Final Phase III ERP/PEIS analysis of the programmatic Preferred Alternative, which evaluated the restoration project type and associated activities for the restoration and protection of birds. The Final Phase III ERP/PEIS analysis of cumulative impacts relevant to the proposed action is incorporated by reference into the following cumulative impacts analysis for the Texas Rookery Islands project. The following analysis focuses on the potential cumulative effects of the proposed Texas Rookery Islands project to the effects of past actions evaluated in the Final Phase III ERP/PEIS cumulative impacts analysis and the effects of some past, present, and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS.

5.2.10.1 Site Specific Review and Analysis of Cumulative Impacts to Relevant Resources

This section describes past, present, and reasonably foreseeable future actions that were not discussed in the Final Phase III ERP/PEIS, but which are relevant to identifying any cumulative impacts the proposed Texas Rookery Islands project may have on a local scale. Context and intensity, defined in Section 5.2.2, are used to determine whether a potential significant cumulative impact from the Texas Rookery Islands project exists.

Past, present, and reasonably foreseeable other future actions relevant to this action, but not analyzed in the Final Phase III ERP/PEIS, were identified based on the best professional judgment of staff, from federal and state natural resource agencies, who have knowledge and experience working in coastal environments in the Gulf of Mexico. Actions that could be relevant to the proposed bird island project cumulative impacts analysis are defined here as those actions with similar scope, timing, impacts and/or location. The Texas Rookery Islands project locations are defined as the three rookery islands in Galveston Bay (Rollover Bay, Smith Point, and Dickinson Bay II Islands) and the rookery island in East Matagorda Bay (Dressing Point Island). Federal and state actions, other Phase IV proposed projects, and other restoration related to the Spill were considered.

For the Texas Rookery Islands project, specifically, the relevant affected resources analyzed in this EA are related to the Physical Environment (geology and substrates, hydrology and water quality and, air quality and GHG emissions, and noise); Biological Environment (living coastal and marine resources and protected resources); and Human Uses and Socioeconomics (cultural resources as well as tourism and recreational use).

The local action area is defined as Galveston Bay and East Matagorda Bay. Actions that would be relevant to the Texas Rookery Islands project cumulative impacts analysis are defined here as those with similar scope, timing, impacts or location.

5.2.10.1.1 Physical Environment

Galveston Bay and East Matagorda Bay have experienced changes to their physical environments in the past, present and would do so in the future. Changes to the bay shoreline margins and islands have occurred due to erosion and relative sea level rise. Outside of Louisiana, Galveston Bay is experiencing the highest relative sea level rise rate in the nation (http://tidesandcurrents.noaa.gov/). Dressing Point Island, a natural island, was once a peninsula and became an island between 1891 and 1909. Its areal extent has decreased substantially over the last 100 years. Islands created by construction of their associated navigation channels have also suffered severe erosion. While navigation traffic can contribute to erosion, the three Galveston Bay Islands (Dickinson Bay II, Rollover Bay, and Smith Point Islands) have experienced most of their land loss through the effects of subsidence, tropical storms and winter storm activity. The rate of relative sea level rise is approximately 2.17 feet per 100 years (http://tidesandcurrents.noaa.gov/). The loss of elevation has not only decreased the size of the island but exacerbated associated erosional wave energies with deeper water bodies. These erosional processes also affect water quality by increasing turbidity at sites during storms and high precipitation events. Other habitats have been affected similarly such as intertidal wetlands. One of the most effective approaches to restoring these lost wetlands has been to use nearby fill material with breakwater features. While the efforts to restore wetlands are significant, the loss of habitat associated with the ground water induced subsidence of the late 1960s in Galveston Bay is considerable (GBEP 2011).

The project action would change trends associated with these sites in terms of increasing their size by using nearby bay sediments or importing sediments from nearby uplands. Impacts from this project with respect to geology and substrates are expected to be minor given potential changes that have occurred and are expected to occur. Water quality may be affected locally but would be temporary and minor considering other projects expected to occur. Air quality and noise are negligible given activities present today. Projects having similar effects in the future are not expected to be significant provided the current regulatory requirements and BMPs available. It is unlikely that the intertidal and above tidal habitats that have been lost would be replaced to their former extent.

5.2.10.1.2 Biological Environment

As stated in the previous section, substantial effects to these two bay systems have occurred due to relative sea level rise. These changes have affected biological resources of both bays. Overall there has been an increase in the aquatic estuarine environment and its depth. Significant losses to the extent of oyster reefs due to fossil reef mining and changes in bay salinity regimes have occurred. Tropical storms such as Hurricane Ike and Hurricane Carla impacted oyster reef and bay seagrass beds respectively. Changes in water quality have also affected these habitat resources as well as fisheries resources such as pollution and long-term contaminants. Avian resources were also affected by contaminants like DDT. Biological resources have been affected by reduced freshwater inflows due to drought and river withdrawals. Essential fish habitat has been changed by other restoration projects. This project would

convert some open water estuarine habitat into coastal upland habitat. The amount of open water habitat in these bays is expected to increase in the future and the impacts of these projects are negligible. Hard substrates may be affected by this project, however, this habitat type is expected to increase over time as other sites and shorelines erode and by restoration projects targeting oyster reef habitat and those using limestone for armoring shorelines. This project would add a substantial hard substrate component in the form of breakwater or armoring.

The Texas coast currently supports many colonial waterbird nesting islands. Many of these sites were constructed in association with construction of navigation channels. While availability of nesting sites may not be the sole factor that limits the numbers of colonial nesting birds, it can play a significant role since foraging habitat does not appear to be a limiting factor for most species. Current rates of erosion and relative sea level rise have generated concerns in the conservation community given the current rate of change that appears to be taking place. Some sites are no longer used by birds because they have suffered significant land loss, changes to the vegetation, have been continually disturbed by predators or people, or are no longer of sufficient elevation to avoid overwash events. Actions to restore and protect rookery island habitat have occurred at some sites; however, there are a significant number of sites that need restoration support. It is likely that other rookery island projects would be developed, planned, and implemented that would complement the Texas Rookery Islands project. Funding for this type of activity is limited since most public funding sources target wetland restoration and water quality improvements, neither of which directly supports island restoration and protection. These combined factors only emphasize the importance of this project in order to maintain and protect waterbird populations. The diversity of species and the great numbers that are a supported by highly productive systems make the upper Texas coast a prime international birding destination. These birding and nature tourists provide significant revenue of funding into local communities and businesses (USFWS 2013a).

5.2.10.1.3 Human Use and Socioeconomics

The human population associated with the upper Texas Coast is expected to increase substantially in the next 50 years (Texas Water Development Board 2012). This overall increase would result in more natural resource users that include nature watchers, anglers, hunters, and water sports enthusiasts. The increased numbers of users would impact living resources along the coast. Commercial industries associated with these activities including the commercial seafood industry would benefit by this increase in population if estuarine resources are sustained. The temporary impacts associated with users of the bay from this project would be negligible. The level of activities by other bay related projects and this project would preclude opportunities recreational users in other parts of both bay systems. Impacts to commercial users are not expected to be significant in the near term. The long-term impacts from the projects would be positive for recreational and commercial users of the bay.

5.2.10.2 Potential Cumulative Impacts When Evaluated with Other DWH Restoration Funds Projects

DWH restoration funds projects include other Phase IV Early Restoration Projects and Gulf Environmental Benefit Fund (GEBF) projects. Due to the nature of this proposed project, the proposed Texas Rookery Islands project is not anticipated to contribute to potential adverse cumulative impacts in combination with other Phase IV projects. The Texas Rookery Island project could contribute to cumulative benefits to resources through the following GEBF projects: Oyster Reef Restoration in East Bay, Anahuac National Wildlife Refuge Coastal Marsh Acquisition, and Dollar Bay-Moses Lake Shoreline Enhancement and Restoration. The Oyster Reef and Rookery Islands projects will benefit benthic habitat in Galveston Bay. When the Dollar Bay-Moses Lake Shoreline Enhancement and Restoration project is implemented (currently GEBF funding is for data collection, geotechnical analysis and engineering/design development only), the Dollar Bay, Anahuac, and Rookery Island projects would benefit avian resources and benthic habitat.

5.2.10.3 Summary of Cumulative Impacts of the Proposed Action

Overall, the cumulative impacts of the proposed Texas Rookery Islands project when considered with respect to past, present, and reasonably foreseeable future actions would result in beneficial impacts over the long-term and negligible short- or long-term adverse impacts. This project would contribute not only to the restoration and protection of colonial nesting waterbirds but help ameliorate potential future adverse impacts associated with past, present and future changes expected for the upper Texas coast.

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Chapter 6: Restoring Living Shorelines and Reefs in Mississippi Estuaries Project

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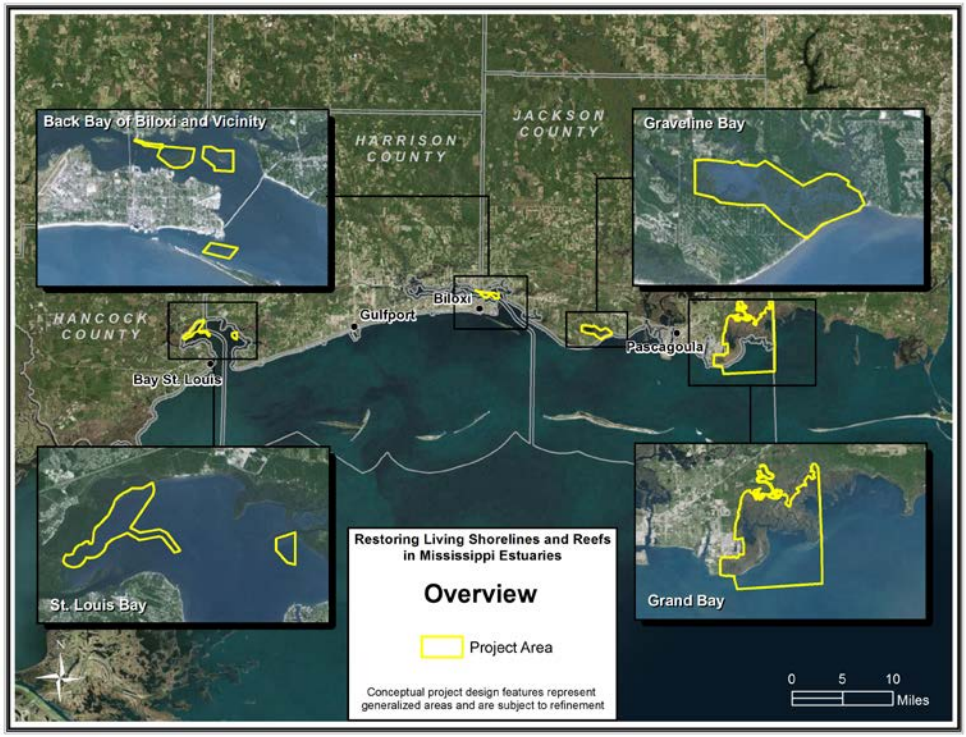
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6.1 Restoring Living Shorelines And Reefs In Mississippi Estuaries: Project Description

6.1.1 Project Summary

The Restoring Living Shorelines and Reefs in Mississippi Estuaries includes the restoration of secondary productivity through the placement of intertidal and subtidal reefs and the use of living shoreline techniques including breakwaters. The projects will be implemented at locations in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay in Jackson, Harrison, and Hancock Counties, Mississippi. The project builds on recent collaborative projects implemented by the Mississippi Department of Marine Resources (MDMR), National Oceanic and Atmospheric Administration, and The Nature Conservancy. When completed at all locations, the project will provide for construction of over four miles of breakwaters, five acres of intertidal reef habitat and 267 acres of subtidal reef habitat at four locations across the Mississippi Gulf Coast (Figure 6-1). For the Grand Bay and Graveline Bay project locations, intertidal and subtidal reefs will be created in a number of sites. Over time, the breakwaters, intertidal and subtidal restoration areas will develop into living reefs that support benthic secondary productivity, including, but not limited to oysters/bivalve mollusks, annelid worms, shrimp, and crabs. Breakwaters will reduce shoreline erosion as well as marsh loss.

Figure 6-1. Restoring Living Shorelines and Reefs in Mississippi Estuaries-Vicinity Map Depicting Project Locations and Project Areas[1]



6.1.2 Background and Project Description

The project components[2] are grouped into four project locations: Grand Bay; Graveline Bay; Back Bay of Biloxi and vicinity; and St. Louis Bay. For this project, the living shoreline approach includes constructing multiple breakwaters made of suitable manufactured and/or natural materials that reduce shoreline erosion by dampening wave energy while encouraging reestablishment of habitat that was once present in the region. Breakwaters will develop into reefs that support secondary productivity (living reefs).

[1] Project areas encompass the project components, the direct restoration measures and potential areas for construction or indirect impacts. Conceptual design features (breakwaters, intertidal reef habitat, subtidal reef habitat, and temporary flotation channels) are subject to refinement and will be sited within respective project areas.

[2] project components are located in four locations across the Mississippi Gulf Coast and each include some combination of the following restoration measures; intertidal reef habitat restoration; subtidal reef habitat restoration and breakwater construction. Grand Bay and Graveline Bay are each considered a project location with numerous intertidal and subtidal reefs sites.

Subtidal and intertidal reefs will be built using suitable cultch material (e.g. limestone, crushed concrete, oyster shell or a combination thereof). Some sites will be built to complement existing restoration project sites implemented by MDMR, NOAA, and The Nature Conservancy. The early restoration project components are listed in Table 6-1, shown in Figures 6-1 to 6-9, and are described below. The following definitions are to clarify restoration techniques/components which will be implemented for the Restoring Living Shorelines and Reefs in Mississippi Estuaries Early Restoration project:

Living Shoreline Approach: A shoreline management practice that provides erosion control benefits; protects, restores, or enhances natural shoreline habitat; and re-establishes land and water ecological connections and maintains coastal processes through the strategic placement of plants, stone, sand fill, and other structural organic materials (e.g. biologs, oyster reefs, etc) or the natural establishment of organic materials such as sediments and plants. The Mississippi Phase IV Early Restoration living shoreline project may include establishing one or more of the following components:

Breakwaters: Linear structures that may utilize artificial and/or shell-based materials placed parallel to the shore in medium to high energy open-water environments for the purpose of dissipating wave energy to reduce shoreline erosion.

Reef Habitat: Large colonial aggregations of living oysters and other bi-valves that can have subtidal as well as intertidal portions, and provide habitat for a community of other species (e.g., tunicates, fish, crabs, worms, mussels, bryozoans, and barnacles).

Living Shorelines Techniques: The Mississippi Phase IV Early Restoration project may use the following techniques to implement a living shorelines approach.

Reef Development: the process of placing breakwaters that are designed to support secondary benthic productivity through colonization by species associated with reefs. Reefs also create calm areas near the shoreline, which can support colonization by submerged aquatic vegetation and marsh grasses to create intertidal and marsh habitat for aquatic organisms. Through this process, a reef can also reduce coastal wave energy and current action to reduce shoreline erosion.

Subtidal reefs: A reef that is constructed so that the structure is always under water or covered by water at all times under average meteorological conditions.

Intertidal reefs: A reef that is constructed so that a portion of the structure lies within the zone between the mean higher high water and mean lower low water lines.

Comment [LJ1]: Lot of added info not in DERP. Is this in response to a public comment? Are they necessary? Are they consistent with usage for other LS projects/meant to be specific to MS project?

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Table 6-1. Restoring Living Shorelines and Reefs in Mississippi Estuaries-Project Components

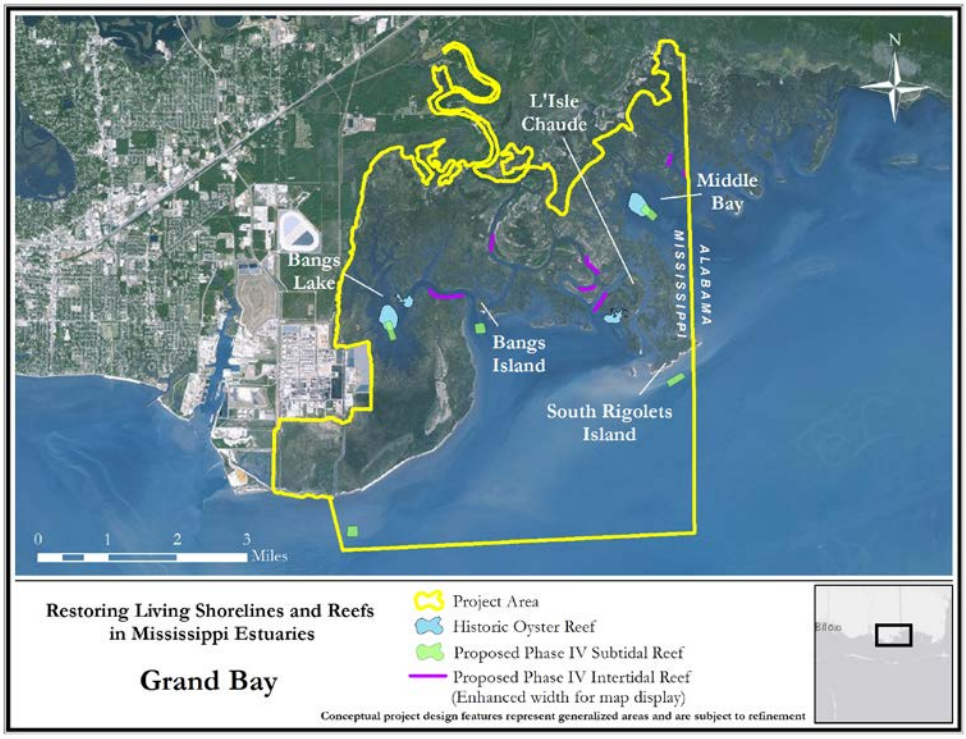
Project Components	Breakwater Structure Length (feet)	Subtidal Reef Habitat (acres)	Intertidal Reef Habitat (acres)
Grand Bay and Graveline Bayou (Jackson County)			
Grand Bay Intertidal and Subtidal Reefs		77	3
Graveline Bay Intertidal and Subtidal Reefs		70	2
Back Bay of Biloxi and Vicinity (Jackson and Harrison County)			
Channel Island Living Shoreline and Subtidal Reefs	2,385	70	-
Big Island Living Shoreline	5,011	-	-
Little Island Living Shoreline	2,316	-	-
Deer Island Subtidal Reef	-	20	-
St. Louis Bay (Harrison and Hancock County)			
Wolf River Living Shoreline and Subtidal Reef	1,388	30	-
St. Louis Bay Living Shoreline	10,812	-	-
TOTAL	21,912 feet 4.1 miles	267 acres	5 acres

6.1.2.1 Grand Bay Project Component (Jackson County)

Grand Bay Intertidal and Subtidal Reefs (Figure 6-2): The Grand Bay Intertidal and Subtidal Reefs project component will restore approximately 3 acres of intertidal reefs in the intertidal waterways of Grand Bay. Approximately 77 acres of subtidal reef habitat will be restored in the nearshore environment of Grand Bay. Conceptual site locations for the intertidal and subtidal reefs are depicted in Figure 6-2 and are subject to refinement.

Figure 6-2. Grand Bay Intertidal and Subtidal Reefs Project Area[3]

[3] Project areas encompass the project components, the direct restoration measures and potential areas for construction or indirect impacts. Conceptual design features (breakwaters, intertidal reef habitat, subtidal reef habitat, and temporary flotation channels) are subject to refinement and will be sited within respective project areas.



6.1.2.2 Graveline Bay Project Component (Jackson County)

Graveline Bay Intertidal and Subtidal Reefs (Figure 6-3): The Graveline Bay Intertidal and Subtidal Reefs project component will restore approximately two acres of intertidal reefs along the intertidal waterways of Graveline Bay. Approximately 70 acres of subtidal reef habitat will be restored in the nearshore environment of Graveline Bay. Conceptual site locations for the intertidal and subtidal reefs are depicted in Figure 6-3 and are subject to refinement.

Figure 6-3. Graveline Bay Intertidal and Subtidal Reefs Project Area

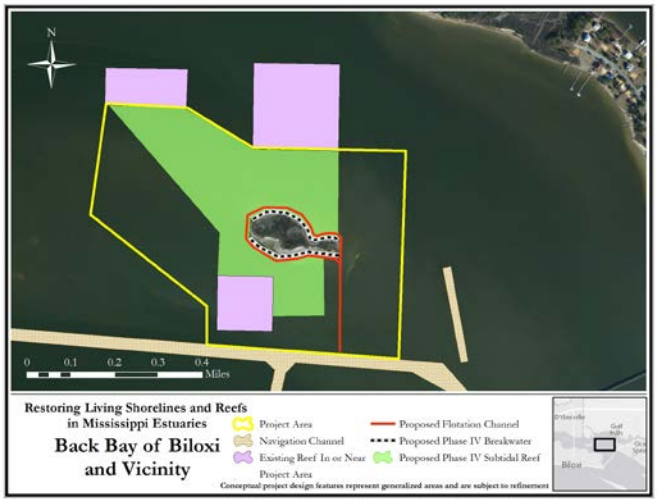


6.1.2.3 Back Bay of Biloxi and Vicinity Project Components (Jackson and Harrison County)

Back Bay of Biloxi and vicinity will have four project components located along islands within Back Bay of Biloxi, which currently experience erosion, and along Deer Island to the south of Back Bay of Biloxi. Using living shoreline techniques, such as construction of breakwaters or other intertidal shoreline stabilization, erosion rates will be reduced along approximately 1.8 miles of marsh island shoreline in Back Bay of Biloxi. Approximately 90 acres of subtidal reef habitat will be restored at locations in Back Bay of Biloxi and in the vicinity on the north side of Deer Island, adjacent to existing reef projects.

Channel Island Living Shoreline and Subtidal Reefs (Figure 6-4): Will include construction of approximately 2,385 ft. of breakwater along the shoreline. Approximately 70 acres of subtidal reef habitat will be created and will connect the breakwater structure to an existing subtidal reef on the north and south sides of the island. The conceptual site location for the breakwater, subtidal reefs and temporary flotation channels are depicted in Figure 6-4 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

Figure 6-4. Channel Island Living Shoreline and Subtidal Reefs Project Area



Big Island Living Shoreline (Figure 6-5): Will include construction of approximately 5,011 ft. of breakwater along the southern facing shoreline directly adjacent to the navigation channel. The conceptual site location for the breakwater and temporary flotation channels are depicted in Figure 6-5 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

Figure 6-5. Big Island Living Shoreline Project Area



Little Island Living Shoreline (Figure 6-6): Will include construction of approximately 2,316 ft. of breakwater along the southern facing shoreline directly adjacent to the navigation channel. The conceptual site location for the breakwater and temporary flotation channels are depicted in Figure 6-6 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

Figure 6-6. Little Island Living Shoreline Project Area



Deer Island Subtidal Reef (Figure 6-7): Will expand an existing MDMR nearshore reef at Deer Island to create approximately 20 acres of subtidal reef habitat. The conceptual site location for the subtidal reef is depicted in Figure 6-7 and is subject to refinement.

Figure 6-7. Deer Island Subtidal Reef Project Area



6.1.2.4 St. Louis Bay Project Components (Harrison and Hancock County)

St. Louis Bay will have two project components including approximately 2.3 miles of breakwater and approximately 30 acres of subtidal reef habitat restoration at two locations.

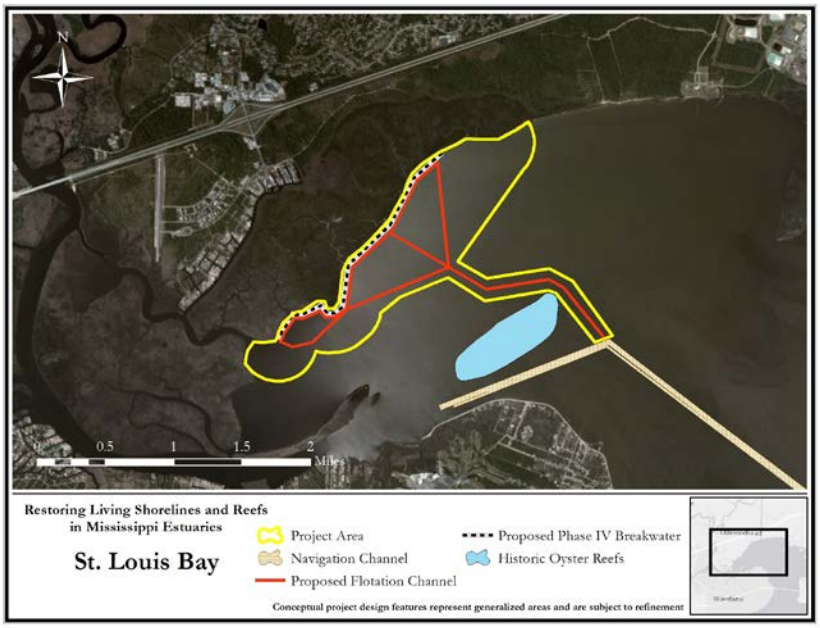
Wolf River Living Shoreline and Subtidal Reef (Figure 6-8): Will include construction of approximately 1,388 ft. of breakwater along the island at the mouth of the Wolf River in St. Louis Bay. This will also include construction of approximately 30 acres of subtidal reef habitat in St. Louis Bay, adjacent to existing reef projects at the mouth of the Wolf River. Conceptual site locations for the breakwater, subtidal reefs and temporary flotation channels are depicted in Figure 6-8 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

Figure 6-8. Wolf River Living Shoreline and Subtidal Reef Project Area



St. Louis Bay Living Shoreline (Figure 6-9): Will include the construction of approximately 10,812 ft. of breakwater in St. Louis Bay. Conceptual site locations for the breakwater and temporary flotation channels are depicted in Figure 6-9 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

Figure 6-9. St. Louis Bay Living Shoreline Project Area



6.1.3 Construction Methodology and Timing

Construction methods and activities are included to assess the environmental impacts from the project. Actual construction methods and activities will be determined after final design and will be comparable to activities described below.

Breakwaters: The breakwater design selected at each site represent the maximum footprint that will be impacted by placement of the structure (see Table 6-2). Any adjustments to the project scale during final design will be no greater than the parameters in Table 6-2. The breakwater will have gaps ranging from three to 25 feet wide throughout the length of the structure. During final design every effort will be made to reduce environmental impacts associated with the project. Construction will take place within the maximum bottom width identified in Table 6-2. Construction will include the placement of linear structures that will utilize appropriate manufactured and/or natural materials. The alignment and limits of the breakwaters will be sited within the project study area shown in Figures 6-4, 6-5, 6-6, 6-8 and 6-9. Navigation signs are anticipated to be required by the USCG Private Aids to Navigation Office. The numbers of navigation signs are estimated in Table 6-2, below. Navigation signs will consist of a 12-inch treated piling with a plywood or aluminum day board sign and a lighted beacon, if required. A vibratory hammer from a barge will be used to push piles to a depth ranging from 10 to 30 feet below the substrate. This will put the day board sign at approximately +10.0 Mean Lower Low Water (MLLW).

The materials will be stockpiled at an existing staging area near the project area, which has water access. Mechanical equipment will be utilized to load the materials onto a material handling barge. The materials will be transported to the work area to be deployed by a crane and/or long armed track hoe located on the equipment barge. Placement of the breakwater structure will be monitored to ensure the breakwater dimensions, slopes, and crest elevations are achieved.

Subtidal Reef Habitat: The subtidal reef habitat will be constructed using appropriate cultch material (limestone, crushed concrete, oyster shells or a combination thereof). The cultch materials will be stockpiled at an existing upland staging area, which has water access to the project area. The cultch materials will be inspected at the existing upland staging area prior to being loaded onto a barge to ensure the materials are clean and free of all debris, including but not limited to, trash, steel reinforcement, and asphalt. Mechanical equipment will be utilized to load the materials onto shallow draft barges or shallow draft self-powered marine vessels. The material will be deployed using a high pressure water jet or using a clam-shell bucket mounted on a crane or a long armed track hoe located on a separate equipment barge. The cultch material will be deployed in water depths ranging from 0 to -10 MLLW. The cultch material thickness will range from 1 to 12 inches (Table 6-3).

Table 6-2. Restoring Living Shorelines and Reefs in Mississippi Estuaries Preliminary Design Parameters and Construction Techniques for Breakwater Structures

Project Component		Maximum Structure Width (ft.)	Structure Length (ft.)	Footprint (acres)	Navigation Signs (each)*	Estimated in-water Construction Time (months)
Back Bay of Biloxi	Channel Island Living Shoreline and Subtidal Reef	30	2,385	1.6	0 to 14	8
	Big Island Living Shoreline	30	5,011	3.5	0 to 27	12
	Little Island Living Shoreline	30	2,316	1.6	0 to 14	8
St. Louis Bay	Wolf River Living Shoreline and Subtidal Reef	40	1,388	1.3	0 to 9	6
	St. Louis Bay Living Shoreline	40	10,812	9.9	0 to 56	12
Total			**21,912**	**17.9**	**0 to 120**	**6 – 12**

*Represents preliminary estimate of number of signs; Consultation with the US Coast Guard Private Aids to Navigation Division will be coordinated to determine the required type and spacing of navigation signs.

Intertidal Reef Habitat: The Intertidal reef habitat will be constructed using loose or bagged oyster shells. Oyster shells will be bagged and stockpiled at an existing upland staging area, which has water access to the project area. The bagged oyster shells will be loaded by hand onto shallow draft marine

vessels. The shallow draft vessels will transport the bagged oyster shells to the project location where they will be unloaded and placed by hand. The intertidal reef habitat will be constructed along the water's edge between MLLW and Mean Higher High Water (MHHW). Tide surveys will be conducted prior to beginning construction and PVC poles will be placed in the ground to mark the high and low tide elevations (Table 6-3).

Table 6-3. Restoring Living Shorelines and Reefs in Mississippi Estuaries Intertidal and Subtidal Reef Habitats

Project Components		Subtidal Reef Habitat Area (acres)	Intertidal Reef Habitat Area (acres)	Estimated Construction Time (months)
Grand Bay	Grand Bay Intertidal and Subtidal Reefs	77	3	4
Graveline Bay	Graveline Bay Intertidal and Subtidal Reefs	70	2	4
Back Bay Biloxi and Vicinity	Channel Island Living Shoreline and Subtidal Reefs	70	-	4
	Deer Island Subtidal Reef	20	-	2
St. Louis Bay	Wolf River Living Shoreline and Subtidal Reef	30	-	2
Total		**267**	**5**	**2 – 4**

Temporary Flotation Channels*:* Temporary flotation channels may be required to facilitate access for work barges in shallow project areas. If required, the channels will be excavated perpendicular to the breakwater for access from navigation channels and parallel to the alignments of the breakwater for construction of the breakwater. The channels will be excavated to a maximum of 6 ft. below MLLW to accommodate barge draft. The bottom width of the channels will be approximately 80 ft. with 3H:1V side slopes. The footprint of channels will be minimized to the extent practicable. The temporary flotation channels will be filled in mechanically using a clam-shell bucket or long-arm excavator or comparable methodology after installation of the structures is completed. Best Management Practices (BMPs) will be followed during excavation and backfilling to minimize environmental impacts. The preliminary temporary flotation channel footprint was calculated based on a heavily loaded barge in order to estimate the maximum potential impact. Selected temporary flotation channel dimensions are summarized in Table 6-4. Temporary flotation channels may be avoided depending on project design and/or construction timing.

Table 6-4. Restoring Living Shorelines and Reefs in Mississippi EstuariesTemporary Flotation Channel

Project Components		Channel Length (ft.)	Channel Depth Below MLLW (ft.)	Channel Width (ft.)	Temporarily Impacted Area (acres)
Back Bay of Biloxi	Channel Island Living Shoreline and Subtidal Reef	4,282	6	80	7.9
	Big Island Living Shoreline	5,060	6	80	9.3
	Little Island Living Shoreline	2,450	6	80	4.5
St. Louis Bay	Wolf River Living Shoreline and Subtidal Reef	2,916	6	80	5.4
	St. Louis Bay Living Shoreline	31,766	6	80	58.3
Total					**85.4**

Construction Footprint Summary: The maximum construction footprint of the 1) breakwater structures is 17.9 acres; 2) subtidal reefs is 267 acres; 3) intertidal reefs is 5 acres; and 4) flotation channels is 85.4 acres. The total maximum construction footprint of all breakwater structures, reefs, and flotation channels is 375.3 acres. Actual construction methods and activities will be determined after final design and will be comparable to activities described above. Any adjustments to the project during final design are anticipated to reduce the environmental impacts associated with the project.

6.1.4 Evaluation Criteria

This project meets the evaluation criteria for the Framework Agreement and OPA. The project will restore injured salt marsh and lost benthic secondary productivity resulting from the Spill in an effort to make the environment whole by restoring, rehabilitating, replacing, or acquiring comparable natural resources injured by the Spill. The nexus to resources injured by the Spill is clear; (see C.F.R. § 990.54(a)(2) and Sections 6(a)-(c) of the Early Restoration Framework Agreement). The project is technically feasible and utilizes proven techniques with established methods and documented results. Government agencies have successfully implemented similar projects in the region. For these reasons, the project has a high likelihood of success. Further, cost estimates are based on similar past projects, and the project can be conducted at a reasonable cost (see C.F.R. § 990.54(a) (1) and (3) and Section 6e of the Early Restoration Framework Agreement). A thorough environmental assessment, including review under applicable environmental statutes and regulations, is described in Section 6.2.8, indicates that adverse effects from the project will largely be minor, localized, and often of short duration. In addition, the best management practices and measures to avoid or minimize adverse effects described in 6.2.8 will be implemented. As a result, collateral injury will be avoided and minimized during project implementation (construction and installation and operations and maintenance) (15 C.F.R. § 990.54(a)

(4)). The project is not inconsistent with long-term restoration needs (see Section 6d of the Early Restoration Framework Agreement). The project will not adversely affect public health and safety; see Section 6.2.7.3.4 of this document.

6.1.5 Performance Criteria and Monitoring

Monitoring will be used to evaluate the restoration goals of the project: 1) construct breakwater structures to protect shoreline from erosion, to facilitate reef development, and to support secondary production; and 2) restore subtidal reef habitat and intertidal reef habitat to support secondary production. Post-construction performance monitoring will be for five years following completion of the project and will evaluate the project's performance over time with respect to the production and support of organisms on the living shoreline (e.g., secondary productivity). Components of this monitoring may include collecting information with respect to:

- Structural integrity of breakwater structure;
- Shoreline profile and position;
- Spatial footprint of breakwaters, intertidal reefs and subtidal reefs;
- Biological monitoring.

This project will incorporate a mix of monitoring efforts to ensure project designs are correctly implemented during construction and will allow for corrective actions to be taken where necessary. The monitoring plan is attached in Appendix B. The monitoring plan is based on the current conceptual design for the project and will be refined as the project siting and design is finalized.

6.1.6 Maintenance

Maintenance activities for various project components may include adding suitable manufactured and/or natural materials. The breakwaters are anticipated to experience the greatest consolidation of the subgrade in the first year following construction. Additional placement of manufactured and/or natural materials on the breakwaters will be assessed during the regular monitoring and may be implemented as project funds allow. Subtidal and intertidal reefs may require short-term maintenance to ensure proper elevations are maintained to promote secondary productivity (e.g., add more material).

6.1.7 Offsets

For the purposes of negotiation of Offsets with BP in accordance with the Framework Agreement, the Trustees used Resource Equivalency Analysis and Habitat Equivalency Analysis to estimate appropriate biological and habitat Offsets for the Restoring Living Shorelines and Reefs in Mississippi Estuaries. Habitat Offsets (expressed in DSAYs[4]) were estimated for salt marsh habitat protected by this restoration, based on the expected spatial extent and duration of improvements attributable to the

[4] **Discounted Service Acre-Years (DSAYs)** is defined in Appendix C.

project. In estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, anticipated protection of existing marsh provided by the project, and the time period over which the project will continue to provide benefits. The Trustees and BP agreed that if this restoration project is selected for implementation, BP will receive Offsets of 34 DSAYs of Salt Marsh Habitat[5], applicable to Salt Marsh Habitat injuries in Mississippi, as determined by the Trustees' total assessment of injury for the Spill.

If the combination of Offsets for Salt Marsh Habitat injuries from the Phase I and Phase III early restoration projects in Mississippi and from the Restoring Living Shorelines and Reefs in Mississippi Estuaries exceeds the Salt Marsh Habitat injuries in Mississippi, then the remaining unused Salt Marsh Habitat DSAYs from this project will be converted to Secondary Productivity[6], (at a rate of 1,000 Dkg-Ys of Secondary Productivity per Salt Marsh Habitat DSAY) and applied to Estuarine Dependent Aquatic Biomass[7] injuries first in Mississippi waters and then, if that category of injury is exhausted in Mississippi waters, to such injury in Federal Waters on the Continental Shelf. These NRD Offsets for Salt Marsh Habitat (and, if applicable, Secondary Productivity) shall not apply to injuries in Texas, Louisiana, Alabama and/or Florida.

Comment [LJ2]: Add FN indication definition of Continental Shelf is also defined in Appendix C?

(Term sheet includes a definition of **Continental Shelf)**

Benthic Secondary Productivity Offsets (expressed in Dkg-Ys[8]) were estimated for expected increases in invertebrate infaunal and epifaunal biomass attributable to the project. In estimating Dkg-Ys, the Trustees considered a number of factors, including, but not limited to, typical productivity in the project area, estimated project lifespan, and project size. The Trustees and BP agreed that if this restoration is selected for implementation, BP will receive Offsets of 1,933,164 Dkg-Ys of benthic Secondary Productivity, applicable to benthic Secondary Productivity injuries in Mississippi, as determined by the Trustees' total assessment of injury for the Spill.

If the combination of Offsets for benthic Secondary Productivity from the Phase I and Phase III early restoration projects in Mississippi and from this Restoring Living Shorelines and Reefs in Mississippi Estuaries exceeds the injury to benthic Secondary Productivity in Mississippi waters then the remaining unused Offsets for benthic Secondary Productivity from this project will be applicable to injuries to Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat[9] at a rate of 5 Dkg-Ys of Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat per 100 Dkg-Ys benthic Secondary Productivity (up to a maximum of 96,658 Dkg-Ys of Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat). These

[5] **Salt Marsh Habitat** is defined in Appendix C.

[6] **Secondary Productivity** is defined in Appendix C.

[7] **Estuarine Dependent Aquatic Biomass** is defined in Appendix C.

[8] **Discounted kilogram-years** is defined in Appendix C.

[9] **Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat** is defined in Appendix C.

remaining Offsets will be applied first to offset such injuries in Mississippi waters and then, if that category of injury is exhausted in Mississippi waters, to such injuries in Federal Waters on the Continental Shelf. These NRD Offsets for benthic Secondary Productivity (and, if applicable, Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat) shall not apply to injuries in Texas, Louisiana, Alabama and/or Florida.

These Offset types and amounts are reasonable for this project.

6.1.8 Estimated Cost

The estimated cost to implement this project is $30,000,000. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, and monitoring.

6.2 Restoring Living Shorelines and Reefs in Mississippi Estuaries Environmental Assessment

6.2.1 Introduction and Background, Purpose and Need

CEQ encourages federal agencies to "tier" their NEPA analyses from other applicable NEPA documents to create efficiency and reduce redundancy, and has issued new guidance on the use of programmatic NEPA documents for tiering.

Tiering has the advantage of not repeating information that has already been considered at the programmatic level so as to focus and expedite the preparation of the tiered NEPA review(s). When a PEIS has been prepared and an action is one anticipated in, consistent with, and sufficiently explored within the programmatic NEPA review, the agency need only summarize the issues discussed in the broader statement and incorporate discussion from the broader statement by reference and concentrate on the issues specific to the subsequent tiered proposal (CEQ 2014).

A federal agency may prepare a programmatic EIS (PEIS) to evaluate broad actions (40 C.F.R. §1502.4(b); see Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18026 (1981)). When a federal agency prepares a PEIS, the agency may "tier" subsequent narrower environmental analyses on site-specific plans or projects from the PEIS (40 C.F.R. § 1502.4(b); 40 C.F.R. §1508.28). Federal agencies are encouraged to tier subsequent narrower analyses from a PEIS to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental assessment (40 C.F.R. § 1502.20). The 2014 Final Programmatic and Phase III Early Restoration Plan and Programmatic Environmental Impact Statement (Final Phase III ERP/PEIS) was prepared for use in tiering subsequent early restoration plans and projects, such as Phase IV.

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the programmatic portions of the Final Phase III ERP/PEIS. This EA qualifies for tiering from the Final Phase III ERP/PEIS in accordance with Department of the Interior regulations (43 CFR 46.140, Using tiered documents) under "b" and "c".

This project is consistent with the Final Phase III ERP/PEIS' Preferred Alternative as described in the 2014 Record of Decision (79 *FR* 64831-64832 (October 31, 2014)) and the Trustees find that the conditions and environmental effects described in the broader NEPA document (with updates as described in Chapter 2) are valid. This project tiers to the analyses found in sections of the PEIS that describe Alternatives 2 (Contribute to Restoring Habitats and Living Coastal and Marine Resources) and 4 (Preferred Alternative: Contribute to Restoring Habitats, Living Coastal and Marine Resources and Recreational Opportunities). Specifically, alternatives and analyses are found in:

- Chapter 5: Early Restoration Programmatic Plan: Development and Evaluation of Alternatives, Section 5.3.3.2; 5.3.3.6

- Chapter 6: Environmental Consequences, Section 6.3.2, and Project Type 2: Protect Shorelines and Reduce Erosion; and Section 6.3.6 Project Type 6: Restore Oysters.

This EA incorporates by reference the analysis found in the PEIS in those sections.

This EA also incorporates by reference all Early Restoration introductory, process, background, and Affected Environment information and discussion provided in the PEIS (Chapters 1 through 6).

6.2.2 Purpose and Need

The purpose and need for this action falls within the scope of the purpose and need for the programmatic portions of the Final Phase III ERP/PEIS because it would accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. The project would restore injured salt marsh and lost benthic secondary productivity in Mississippi resulting from the Spill in an effort to make the environment whole by restoring, rehabilitating, replacing, or acquiring comparable natural resources injured by the Spill. The proposed project would include shoreline erosion reduction using breakwaters and creation of habitat for secondary productivity including breakwaters, intertidal reef habitat and subtidal reef habitat restoration. The project would provide for construction of over four miles of breakwaters, five acres of intertidal reef habitat and 267 acres of subtidal reef habitat at four locations (Figure 6-1). For the Grand Bay and Graveline Bay project locations, intertidal and subtidal reefs would be created at a number of sites. Over time, the breakwater, intertidal and subtidal reef areas would develop into living reefs that support benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, and crabs.

6.2.3 Scope of Environmental Assessment

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the programmatic portions of the Final Phase III ERP/PEIS. The broader environmental analyses of these types of actions as a whole are discussed in the Final Phase III ERP/PEIS from which this EA is tiered. This EA provides NEPA analysis for potential impacts for site specific issues and concerns anticipated from implementation of the proposed action and the no action alternative.

6.2.4 Project Scope

The proposed project would construct approximately four miles of breakwaters, five acres of intertidal reef habitat, and 267 acres of subtidal reef habitat in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity and St. Louis Bay. In addition, 85.4 acres of temporary flotation channel could be required for the construction of breakwaters in shallower estuarine sites in Back Bay of Biloxi and St. Louis Bay. The siting of breakwaters, intertidal and subtidal reefs for the Restoring Living Shorelines and Reefs in Mississippi Estuaries components are conceptual and subject to refinement. For the purposes of impact analysis, the Trustees have conservatively estimated the maximum footprint for permanent and temporary impacts resulting from the deployment of breakwaters, subtidal reefs, and intertidal reefs, as well as the excavation of temporary construction channels. Additionally, an estimated project area in which the total impacts would occur is also provided. Temporary flotation channel conceptual locations

and footprints have been included for the purpose of estimating the maximum temporary impacts, but these impacts may be avoided depending on final project design, construction techniques and/or construction timing. To the extent practicable, submerged aquatic vegetation (SAVs) would be avoided; no SAV impacts are anticipated. To the extent practicable, subtidal reef would be sited on or adjacent to existing or historic hard bottom habitat. Intertidal oyster surveys inventories would be completed as part of siting intertidal reef. Other reasons for refinement in project location include but are not limited to:

- Avoidance of natural or cultural resources (e.g. oysters, SAVs or archaeological sites);
- Natural resource inventory (e.g., locating subtidal reefs on or near existing or historic hard bottom habitat);
- Engineering considerations including but not limited to geotechnical, hydrological, navigational; construction materials, construction techniques or bathymetric design constraints; regulatory permitting constraints; and
- Input received during the public comment period.

Detailed description of project components and construction methodologies are provided in Section 6.1 and Figures 6-2 to 6-9 of this chapter.

6.2.5 Project Alternatives

6.2.5.1 No Action

Both OPA and NEPA require consideration of the No Action alternative. For this section, there are two alternatives, the No Action alternative and the Proposed Action, the Restoring Living Shorelines and Reefs in Mississippi Estuaries. Under No Action alternative, the existing conditions described in Chapter 2, Affected Environment would prevail. Restoration benefits associated with this project would not be achieved at this time.

Under the No Action alternative, this project, which includes the construction of breakwaters, intertidal reef habitat and subtidal reef habitat in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity and St. Louis Bay would not be implemented at this time. There would be no reduction of erosion to those shorelines or development of breakwaters, intertidal and subtidal habitat into living reefs that would support benthic secondary productivity.

6.2.5.2 Proposed Action

The Proposed Action is to implement the Restoring Living Shorelines and Reefs in Mississippi Estuaries as described:

- Approximately four miles of breakwaters, five acres of intertidal reef habitat, and 267 acres of subtidal reef habitat;
- Restoration measures located in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay;

- Temporary flotation channels could be required for the construction of breakwaters in shallower estuarine sites in Back Bay of Biloxi and St. Louis Bay, approximately 85.4 acres. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum temporary impacts, but these impacts may be avoided depending on final project design, construction techniques and/or construction timing.

Under the proposed action, there would be reduction of erosion to shorelines and development of breakwaters, intertidal and subtidal habitat into living reefs that would support benthic secondary productivity in four bays across the Mississippi Gulf Coast.

6.2.6 Project Location

The proposed project is located in Hancock County, Harrison County, and Jackson County Mississippi. The project components would be located in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay. The siting of breakwaters, intertidal and subtidal reefs for the Restoring Living Shorelines and Reefs in Mississippi Estuaries components are conceptual and subject to refinement as described in Section 6.2.4.

6.2.6.1 Grand Bay Project Component (Jackson County)

Grand Bay Intertidal and Subtidal Reefs (Figure 6-2): The proposed project component would be located in open water areas in Grand Bay that have substrate suitable for subtidal and intertidal reef habitat creation. The project component would be located in Jackson County. Currently, five subtidal reef habitats and seven intertidal reef habitats are proposed (Table 6-5).

6.2.6.2 Graveline Bay Project Component (Jackson County)

Graveline Bay Intertidal and Subtidal Reefs (Figure 6-3): The proposed project component would be located in open water areas in Graveline Bay that have substrate suitable for subtidal reef habitat and intertidal reef creation within the Graveline Bay Preserve. Currently, two habitats are proposed, one on the eastern shore of Graveline Bay and one on the western shore of Graveline Bay (Table 6-5). The project component would be located in Jackson County.

6.2.6.3 Back Bay of Biloxi and Vicinity-Project Components (Jackson and Harrison County)

There are four components proposed in the Back Bay of Biloxi and vicinity. Project components and corresponding figures are listed here; locations are summarized in Table 6-5.

- Channel Island Living Shoreline and Subtidal Reef (Figure 6-4)
- Big Island Living Shoreline (Figure 6-5)
- Little Island Living Shoreline (Figure 6-6)
- Deer Island Subtidal Reef (Figure 6-7)

6.2.6.4 St. Louis Bay Project Components (Harrison and Hancock County)

There are two components proposed in St. Louis Bay. Project components and corresponding figures are listed here; locations are summarized in Table 6-5.

- Wolf River Living Shoreline and Subtidal Reef (Figure 6-8)
- St. Louis Bay Living Shoreline (Figure 6-9)

Table 6-5. Restoring Living Shorelines and Reefs in Mississippi Estuaries-Project Components Coordinates

Project Components/Site Location Description[1]	Latitude	Longitude
Grand Bay Proposed Substidal Reefs (Jackson County)		
near the northeast corner of Grand Bay and the Mississippi state line in Middle Bay	30.379088 N	-88.405168 W
near the southeast corner of Grand Bay and the Mississippi state line south of South Rigolets Island	30.344300 N	-88.398240 W
southwest of Grand Bay	30.311702 N	-88.475662 W
northwest of Grand Bay in Bangs Lake	30.353720 N	-88.467059 W
south of Bangs Island	30.354469 N	-88.445520 W
Grand Bay Proposed Intertidal Reefs (Jackson County)		
near the northeast corner of Grand Bay and the Mississippi state line in north of Middle Bay	30.390190 N	-88.400275 W
near the northeast corner of Grand Bay and the Mississippi state line in north of Middle Bay	30.386984 N	-88.396350 W
north of L'Isle Chaude	30.367902 N	-88.418862 W
north of L'Isle Chaude	30.363088 N	-88.419837 W
north of L'Isle Chaude	30.360232 N	-88.416810 W
north of Bangs Island	30.372462 N	-88.442846 W
north of Bangs Island	30.361225 N	-88.453838 W
Graveline Bayou (Jackson County)		
Graveline Bay Intertidal and Subtidal Reefs (eastern shore)	30.371037 N	-88.698404 W
Graveline Bay Intertidal and Subtidal Reefs (western shore)	30.371667 N	-88.709095 W
Back Bay of Biloxi and Vicinity (Jackson and Harrison County)		
Channel Island Living Shoreline and Subtidal Reefs	30.416960 N	-88.859612 W
Big Island Living Shoreline	30.415435 N	-88.875274 W
Little Island Living Shoreline	30.420870 N	-88.885460 W
Deer Island Subtidal Reef	30.385273 N	-88.857752 W
St. Louis Bay (Harrison and Hancock County)		
Wolf River Living Shoreline and Subtidal Reef	30.350533 N	-88.291888 W
St. Louis Bay Living Shoreline	30.358623 N	-89.362785 W

[1] The siting of breakwaters, intertidal and subtidal reefs for the Restoring Living Shorelines and Reefs in Mississippi Estuaries components are conceptual and subject to refinement.

6.2.7 Affected Environment and Environmental Consequences

Under the NEPA, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

In order to determine whether an action has the potential to result in significant impacts, the **context and intensity** of the action must be considered. **Context** refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). **Intensity** refers to the severity of impact and could include the timing of the action (e.g., more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse. For purposes of this document, impacts are characterized as minor, moderate or major, and temporary or long-term. The analysis of beneficial impacts focuses on the duration (short- or long-term), without attempting to specify the intensity of the benefit. The definition of these characterizations is consistent with that used in the Final Phase III ERP/PEIS, and can be found in Appendix D.

According to the CEQ Regulations for Implementing NEPA (Section 1502.1 and 1502.2) agencies should "focus on significant environmental issues" and for other than significant issues there should be "only enough discussion to show why more study is not warranted." After preliminary investigation, some resource areas were determined to be either unaffected or minimally affected by the proposed action. These resources are not discussed in further detail below. Only those resource areas with potential, adverse impacts are discussed in detail below.

The programmatic analysis looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resources that are not expected to be affected are simply not evaluated further under a given project. Resource areas not analyzed in project-specific detail along with a brief rationale for non-inclusion are listed and discussed below:

Air Quality and Greenhouse Gas Emissions: Jackson, Harrison and Hancock counties are classified as in attainment, meaning criteria air pollutants do not exceed National Ambient Air Quality Standards (NAAQS). For this Phase IV project, construction would occur in four bays and would likely not occur simultaneously. Whether construction occurred simultaneously or incrementally, the project would have no long-term impacts on air quality or to emissions of greenhouse gases. In addition the following best management practices would be implemented for the Restoring Living Shorelines and Reefs in Mississippi Estuaries:

- Shut down idling construction equipment, if feasible.
- Locate staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites.
- Encourage the use of the proper size of equipment for the job to maximize energy efficiency.

- Encourage the use of alternative fuels or power sources for generators at construction sites, such as propane or solar power, or use electrical power where practicable.

Noise: For this Phase IV project, noise impacts would be restricted to a brief construction window and would be short-term minor impacts with little or no long-term impact to ambient noise conditions. In addition, the construction activities are primarily in-water work and would not be directly adjacent to residential and commercial development.

Socioeconomic and Environmental Justice: For the Restoring Living Shorelines and Reefs in Mississippi Estuaries, in-water construction would occur at eight sites within four bays in Jackson, Harrison and Hancock Counties. Socioeconomic impacts would be would be beneficial and short-term. The relatively small and remote construction activities are not expected to create a disproportionately high and adverse effect on minority or low-income populations.

Infrastructure: For the Restoring Living Shorelines and Reefs in Mississippi Estuaries there would be limited storage and movement of land-based material storing and therefore limited, short-term impacts to infrastructure, if any. The project would provide long-term beneficial impacts to infrastructure due to shoreline protection. In addition, any impacts to infrastructure in the project area (pipelines, navigation channels) would be avoided or minimized in the planning, engineering and construction of the project.

Tourism and Recreation: For the Restoring Living Shorelines and Reefs in Mississippi Estuaries, construction would result in short-term adverse impacts to recreational activities, primarily fishing and boating.

6.2.7.1 Physical Environment

Geology and Substrates and Water Quality will be discussed in this section.

6.2.7.1.1 Geology and Substrates

Affected Environment

The project area is located within the Gulf Coastal Plain and the Mississippi Alluvial Plain physiographic regions. Landforms and substrates are generally comprised of Holocene sediments. These sediments are composed of sand, silt, and clay with comparatively high organic matter content. The coastal estuaries of Mississippi are composed of mostly sandy fine-grained sediment, silt and clays (Schmid 2015). The project components of the proposed action would be constructed in estuarine shallow water and shallow open water. The habitats can be divided into two classes - intertidal and subtidal. Intertidal zones (typical tidal range of 0.5 ft.) near the project components are generally composed of mud flats and small areas of natural sand beach. In general, the nearshore subtidal habitat is composed mostly of unconsolidated bottom types including sand, muddy sand, and mud bottom. Seismic activity in the project area is low. Since the late 1800s, about ten earthquakes large enough to be detected have occurred in the Gulf of Mexico. These earthquakes were mostly small-magnitude events (magnitudes of 3 to 4 on the Richter scale).

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.1 of the Final Phase III ERP/PEIS describe the impacts to geology and substrates from early restoration project types 2 (Protect Shorelines and Reduce Erosion) and 6 (Restore Oysters). These project types are expected to result in minor to moderate short-term construction-related adverse impacts, primarily related to equipment staging and use, and rutting. The placement of new structures such as breakwaters could result in minor to moderate long-term adverse effects by changing the natural processes of sediment accretion and erosion, preventing washover events, and causing erosion in offsite locations. However, long-term benefits to geology and substrates are also expected, by reduction in erosion/loss of wetlands and stabilization of substrates. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts to geology and substrates. There would be no long-term benefits resulting from slowing shoreline and marsh erosion or from the conversion of cultch to living reefs.

Proposed Action

The maximum construction footprint including breakwater structures, reefs, and flotation channels, if needed, is 375.3 acres. Placement of structures such as breakwaters, intertidal and subtidal reefs would permanently cover existing geology and substrates. The adverse effects would be minor to moderate and long-term, because they would affect substrate/geologic characteristics of the project footprint, and could extend beyond the construction period. There would be long term, minor to moderate impacts to 289.9 acres of soft bottom and hard bottom habitat due to the construction of breakwaters (17.9 acres), subtidal reefs (267 acres) and intertidal reefs (5 acres); Table 6-6. Appropriate navigation signage (if required) would be placed on approximately 12-inch diameter posts adjacent to the breakwaters. This would impact a small area of soft bottom. There would be short term, minor impacts to 85.4 acres of soft bottom habitat for the construction of temporary flotation channels, if needed for construction of breakwaters, subtidal and intertidal reef habitat (Table 6-6). The impacts resulting from the temporary flotation channels would be short-term because the channels would be backfilled as part of the construction process. The project would result in long-term benefit resulting from the development of 289.9 acres of substrate (breakwater materials and cultch) into living reefs that support benthic secondary productivity. There would be long-term benefits to shorelines and marsh resulting from the placement of 21,912 linear feet of breakwater along eroding shorelines (Table 6-2). Breakwaters would reduce the wave energy, thereby slowing shoreline and marsh erosion and resulting in the long-term protection of the shoreline. Therefore, the project would have a long-term beneficial impact on geology and substrate.

Table 6-6. Restoring Living Shorelines and Reefs in Mississippi Estuaries- Project Component Impacts

Project Components	Breakwater Structure Area Max. (acres)	Subtidal Reef Habitat (acres)	Intertidal Reef Habitat (acres)	Temporary Flotation Channels (acres)[10]
Grand Bay and Graveline Bayou (Jackson County)				
Grand Bay Intertidal and Subtidal Reefs		77	3	-
Graveline Bay Intertidal and Subtidal Reefs		70	2	-
Back Bay of Biloxi and Vicinity (Jackson and Harrison County)				
Channel Island Living Shoreline and Subtidal Reefs	1.6	70	-	7.9
Big Island Living Shoreline	3.5	-	-	9.3
Little Island Living Shoreline	1.6	-	-	4.5
Deer Island Subtidal Reef	-	20	-	-
St. Louis Bay (Harrison and Hancock County)				
Wolf River Living Shoreline and Subtidal Reef	1.3	30	-	5.4
St. Louis Bay Living Shoreline	9.9	-	-	58.3
TOTAL	17.9 acres	267 acres	5 acres	85.4 acres

The Final Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures are proposed to avoid and minimize impacts to geology and substrates:

- Temporary flotation channel dimensions (e.g., length, depth and width) would be minimized and to the extent practicable, avoided depending on project design and/or construction timing.
- In areas where temporary flotation channels are required, work barges would be moored for overnight and weekends/holidays only in areas where previous impacts have occurred (temporary flotation channels, deployment areas).
- Spoil from temporary flotation channels would be placed on the side of the channel. After installation of the structures is completed, the temporary flotation channels would be filled in mechanically.
- Pilings would be driven instead of jetting to reduce the disturbance of bottom sediments and bottom dwelling organisms.

[10] Reflects the maximum footprint of temporary flotation channel, if required. Temporary flotation channel dimensions (e.g., length, depth and width) will be minimized and to the extent practicable, avoided depending on project design and/or construction timing.

6.2.7.1.2 Hydrology and Water Quality

Affected Environment

Hydrology and Water Quality

The affected resources consist of shallow water within bays along the Mississippi Gulf Coast in Hancock, Harrison, and Jackson counties. Mississippi's water quality standards specify the appropriate levels for which various water quality parameters or indicators support a water body's designated use(s). Each use assessed for a water body is determined to be either "Attaining" or "Not Attaining" in accordance with the applicable water quality standards and U.S. Environmental Protection Agency (EPA) guidelines for assessments pursuant to §305(b). A water body's use is said to be impaired when—based on current and reliable site-specific data of sufficient quantity, quality, and frequency of collection—it is not attaining its designated use(s). Where data and information of appropriate quality and quantity indicate non-attainment of a designated use or uses for an assessed water body, the water body will be placed on the Mississippi 2014 Section 303(d) List of Impaired Water Bodies (MDEQ 2014). All of the project components are located in the Mississippi Coastal Streams watershed. It has a drainage area of approximately 1,550 square miles (MDEQ 2014) and includes portions of Lamar, Hancock, Pearl River, Stone, Harrison, and Jackson counties. Major tributaries within the Mississippi Coastal Streams watershed include Bayou Casotte, Wolf River, Rotten Bayou, DeLisle Bayou, Bayou La Croix, Bayou Bacon/Jourdan River, Turkey Creek/Bernard Bayou, Biloxi River, and Tuxachanie Creek.

Major rivers carry high sediment loads into the Mississippi Sound. Inland fresh water drainage from these and other smaller rivers, as well as St. Louis Bay and Back Bay of Biloxi, create an estuarine environment in the Mississippi Sound. Variable salinity levels can affect the productivity and survival of organisms living in the Mississippi Sound, as well as economic and recreational activities. Pollution from agriculture, improperly treated sewage, roadways, accidental spills, industry discharges, and other sources also affect the health of the Mississippi Sound.

Grand Bay (Jackson County): Grand Bay is influenced by freshwater flow from Southwest Bayou, Middle Bayou, Clay Bayou, Bayou Cumbest and Bayou Heron. The Grand Bay Intertidal and Subtidal Reefs component features are located in waters classified by the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters (MDEQ 2012) as "shellfish harvesting[11]", "recreation[12]", and "fish and wildlife[13]" (Bang's Lake), and "recreation" and "fish and wildlife[14]" for all other areas in the project location. Bayou Cumbest, which drains directly into Grand Bay, is listed as impaired on the State of Mississippi 303(d) list (MDEQ 2014) for Organic Enrichment / Low Dissolved Oxygen.

[11] Waters in the shellfish harvesting classification are for propagation and harvesting shellfish for sale or use as a food product.

[12] Waters in the recreation classification are to be suitable for recreational purposes, including such water contact activities as swimming and water skiing.

[13] Waters in the fish and wildlife classification are intended for fishing and for propagation of fish, aquatic life, and wildlife.

[14] Waters that meet the Fish and Wildlife criteria are also be suitable for secondary contact recreation.

Graveline Bay (Jackson County): Graveline Bay is influenced by freshwater flow from several small tributaries. The Graveline Bay Intertidal and Subtidal Reefs component features would be located in waters classified by the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters (MDEQ 2012) as "shellfish harvesting", "recreation", and "fish and wildlife" (within Graveline Bay proper), and "recreation" and "fish and wildlife" for all other areas in the project location. None of the waterbodies that drain directly into Graveline Bay are listed as impaired on the State of Mississippi 303(d) list (MDEQ 2014).

Back Bay of Biloxi and Vicinity (Jackson and Harrison County): The Back Bay of Biloxi and Vicinity is influenced by freshwater flow from Tchoutacabouffa River and Biloxi River. Three of the project components (Channel Island, Big Island and Little Island) would be located in waters classified by the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters (MDEQ 2012) as "recreation", and "fish and wildlife". The Deer Island component would be located within waters classified as "shellfish harvesting", "recreation", and "fish and wildlife." None of the waterbodies that drain directly into the Back Bay of Biloxi are listed as impaired on the State of Mississippi 303(d) list (MDEQ 2014).

St. Louis Bay (Harrison and Hancock County): St. Louis Bay is influenced by freshwater flow from the Jourdan River, Bayou Portage and Wolf River. The Wolf River Living Shoreline and Subtidal Reef and St. Louis Bay Living Shoreline project components are located within waters classified by the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters (MDEQ 2012) as "shellfish harvesting", "recreation", and "fish and wildlife." None of the waterbodies that drain directly into St. Louis Bay are listed as impaired on the State of Mississippi 303(d) list (MDEQ 2014).

Tides and Currents

A tidal datum is referenced to a fixed point known as a benchmark and is typically expressed in terms of mean higher high water (MHHW[15]), mean high water (MHW[16]), mean low water (MLW[17]), mean lower low water (MLLW[18]), and mean tidal levels (MTL[19]) over the observed period of time. MHW is the

[15] Mean Higher High Water: The average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch. For stations with shorter series, comparison of simultaneous observations with a control tide station is made in order to derive the equivalent datum of the National Tidal Datum Epoch. The National Tidal Datum Epoch is The specific 19-year period adopted by the National Ocean Service as the official time segment over which tide observations are taken and reduced to obtain mean values (e.g., mean lower low water, etc.) for tidal datums.

[16] MHW Mean High Water: The average of all the high water heights observed over the National Tidal Datum Epoch. For stations with shorter series, comparison of simultaneous observations with a control tide station is made in order to derive the equivalent datum of the National Tidal Datum Epoch.

[17] Mean Low Water: The average of all the low water heights observed over the National Tidal Datum Epoch. For stations with shorter series, comparison of simultaneous observations with a control tide station is made in order to derive the equivalent datum of the National Tidal Datum Epoch.

[18] Mean Lower Low Water: The average of the lower low water height of each tidal day observed over the National

average of all the high-water heights observed over one tidal epoch. MLW is the average of all the low-water heights observed over one tidal epoch. MTL is the mean of the MHW and MLW for that period of time. Water depths in project areas range from 5 to 9 ft. for maximum depths.

Grand Bay, Back Bay and Graveline Bay (Harrison and Jackson County): The Grand Bay NERR, Mississippi Sound, MS - Station ID: 8740166 was selected to determine historical water levels, as it is the closest water level gauge to the project area with appropriate data. The mean range of tide between MHW and MLW is 1.36 ft.; wind and seasonal tides affects local water depth and surface level fluctuations. Maximum depth in the Grand Bay project area is 9 ft., and for the Back Bay of Biloxi and vicinity and for Graveline Bay project areas the maximum depth is 5 ft. This gauge is located at 30° 24.8' N, 88° 24.2' W. The data from the tide station are as follows:

- MHHW = 0.99 ft. NAVD 88
- MHW = 0.89 ft. NAVD 88
- MTL = 0.21 ft. NAVD 88
- MLW = -0.47 ft. NAVD 88
- MLLW = -0.60 ft. NAVD 88

St. Louis Bay (Harrison, and Hancock County): The Bay Waveland Yacht Club gauge (Station ID: 8747437) was selected to determine historical water levels, as it is the closest NOAA water level gauge to the project area with appropriate data. The mean range of tide between MHW and MLW is 1.52 ft.; wind and seasonal tides affects local water depth and surface level fluctuations. The maximum depth in the St. Louis Bay project area is 5 ft. This gauge is located at 30° 19.5'N, 89° 19.5'W. The data from the tide station are as follows:

- MHHW = 1.42 ft. NAVD 88
- MHW = 1.32 ft. NAVD 88
- MTL = 0.56 ft. NAVD 88
- MLW = -0.20 ft. NAVD 88
- MLLW = -0.31 ft. NAVD 88

Floodplains

The project components would be completed in shallow marine environments.

Wetlands

In general, estuarine areas adjacent to the proposed features are composed of low, mid, and high marsh zones. In the low marsh areas, regularly flooded by tidal activity, the area consists of mesohaline

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Tidal Datum Epoch. For stations with shorter series, comparison of simultaneous observations with a control tide station is made in order to derive the equivalent datum of the National Tidal Datum Epoch.

[19] Mean Tide Level: The arithmetic mean of mean high water and mean low water.

habitat. Mesohaline is a measurement of salinity and refers to a water salinity ranging from 8 to 15 parts per thousand (ppt). The intermediate (mid) marsh zone is irregularly flooded by tidal activity and is typically dominated by black needlerush (*Juncus roemerianus*), which can be intermixed with salt grass (*Distichlis spicata*) in oligohaline (salinity of 0.5 to 5.0 ppt) areas. In higher elevation areas, it is not uncommon to observe numerous species intermixed including salt grass, black needlerush, and salt meadow cordgrass (*Spartina patens*).

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.2 of the Final Phase III ERP/PEIS describe the impacts to hydrology and water quality from early restoration project types 2 and 6. These project types are expected to result in minor to moderate short-term construction-related adverse impacts, primarily increases in turbidity. Shoreline protection could also result in minor long-term adverse effects by changing the ocean current patterns in the localized area. However, long-term benefits to hydrology and water quality are also expected, including improving wetland function, reduction in the inland flow of salt water, reduction in nutrient and sediment runoff, and reduction in erosion/loss of wetlands. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts to hydrology and water quality. No mitigation measures would be necessary. The potential benefits to hydrology and water quality would not be realized.

Proposed Action

Environmental consequences affecting hydrology, water quality, tides and currents, wetlands and floodplains are discussed below.

Hydrology, Tides and Currents: Impacts from breakwater construction and subtidal and intertidal reefs are provided here.

Breakwater construction: Shoreline protection and erosion reduction could generally help reduce storm surges on shorelines and marshes. Breakwater construction could reduce the loss of the wetlands and channel networks particularly in St. Louis Bay. Gaps would be present between breakwater segments that would allow tidal exchange flows and waterway access. Breakwaters would change natural current patterns, sediment accretion and erosion rates. Wave energy and resulting erosion would be substantially reduced. This could be a long-term beneficial effect to shorelines that would extend beyond the construction period.

Intertidal and Subtidal Reef Habitat: Creating intertidal and subtidal reef habitat could help protect eroding wetlands and shallow water areas. Placement of cultch and other materials to establish living

reefs adjacent to shorelines and breakwaters would reduce wave energy reaching shorelines. This would provide long-term beneficial effects by reducing wave energy of storm surges as well.

Water Quality: Placement of the breakwaters, subtidal and intertidal reef would result in short-term, minor adverse impacts to water quality as a result of resuspension of sediment by vessels (barges, tugs, skiffs, etc.) moving in and out of the project area, excavation of the temporary flotation channels, placement of breakwaters and deployment of intertidal and subtidal reefs. The suspended sediment may be transported into surrounding wetlands and waterways. However, the area is currently exposed to elevated turbidity levels as a result of resuspension of sediment from river transport and during frequent storms, tides, and other typical weather events. Impacts from turbidity would be minor, short-term and limited in spatial extent.

In addition to turbidity, the water quality could be adversely impacted by leaks or spills of fuel and lubricants used by vessels and other equipment during the construction of the temporary flotation channels, breakwater, and reefs. Impacts, if any, would be short-term, localized and minor. Best management practices are listed at the end of this section.

Breakwaters, once established as living reefs, could benefit local water clarity because bi-valves such as oysters and mussels feed by filtering the water column. The reef could also reduce wave energy reaching the shoreline, minimizing erosion, and decreasing sediment suspended in the water column from erosion. Long-term this method could result in minor improvements to water quality. The benefits would be long-term because they would extend beyond the construction period.

Floodplains: The majority of the project is located below the MHW level and would not impact the floodplain in the project area. Shoreline protection and erosion reduction could generally help reduce storm surges on coastal wetlands, and limit the shoreward extent of saltwater flow.

Wetlands: There would be short-term, minor, and localized indirect impacts from sediment movement that could temporarily impact the shoreline edge near the project components. The project would result in long-term beneficial impacts to salt marsh by reducing shoreline erosion and resulting marsh degradation. These actions could reduce the pace and extent of future saltwater intrusion to freshwater and brackish systems and reduce erosion and loss of the wetlands and channel networks.

The Final Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review procedures would result in the avoidance and minimization of impacts to hydrology and water quality:

- The Trustee would apply for a Mississippi Coastal Wetland Protection Act Permit and authorization by the USACE. Under the Coastal Zone Management Act of 1972, selected restoration projects must be consistent with the federally-approved coastal management programs for the states in which the projects are to be conducted. Best management practices along with other avoidance and mitigation measures required by state and federal regulatory agencies, would be employed to minimize potential water quality and sedimentation impacts.

Authorization by the U.S. Army Corps of Engineers (USACE) under Section 10/404 and State Water Quality Certifications would be required and permit conditions would be met.
- Appropriate BMPs such as routine maintenance, inspection, and proper refueling of construction equipment would be used to prevent, control, and mitigate impacts.
- Temporary flotation channel dimensions (e.g., length, depth and width) would be minimized and to the extent practicable, avoided depending on project design and/or construction timing.
- Spoil from temporary flotation channels would be placed on the side of the channel. After installation of the structures is completed, the temporary flotation channels would be filled in mechanically.

6.2.7.1.3 Summary of Impacts to the Physical Environment

Impacts to the physical environment from implementation of the Restoring Living Shorelines and Reefs in Mississippi Estuaries would include:

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    - Geology and substrates: Minor to moderate short to long-term adverse impacts would occur due to the construction of breakwaters, subtidal reefs and intertidal reefs, and the construction of temporary flotation channels (if needed). The project would result in long-term beneficial impact on shorelines and marsh resulting from the placement of breakwater which would reduce the wave energy by slowing shoreline and marsh erosion and resulting in the long-term protection of the shoreline.
    - Hydrology, tides and currents: Breakwater construction would provide a long-term beneficial effect to shorelines by reducing erosion. Creation of intertidal and subtidal reef habitat would provide long-term beneficial effects by reducing wave energy of storm surges as well.
    - Water quality: Placement of the breakwaters, subtidal and intertidal reef would result in short-term, minor localized adverse impacts to water quality as a result of increased turbidity and potential leaks or spills of fuel and lubricants used by vessels and other equipment during construction. However, long-term benefits would occur due to enhanced water clarity caused by bi-valve filtering of the water column, and decrease of suspended sediment in the water column due to reduction of wave energy reaching the shoreline.
    - Floodplains: Beneficial long-term impacts would occur because shoreline protection and erosion reduction could generally help reduce storm surges on coastal wetlands, and limit the shoreward extent of saltwater flow.
    - Wetlands: There would be short-term, minor, and localized indirect adverse impacts from sediment movement that could temporarily impact the shoreline edge near the project components. The project would result in long-term beneficial impacts to salt

marsh by reducing shoreline erosion and resulting marsh degradation. These actions could reduce the pace and extent of future saltwater intrusion to freshwater and brackish systems and reduce erosion and loss of the wetlands and channel networks.

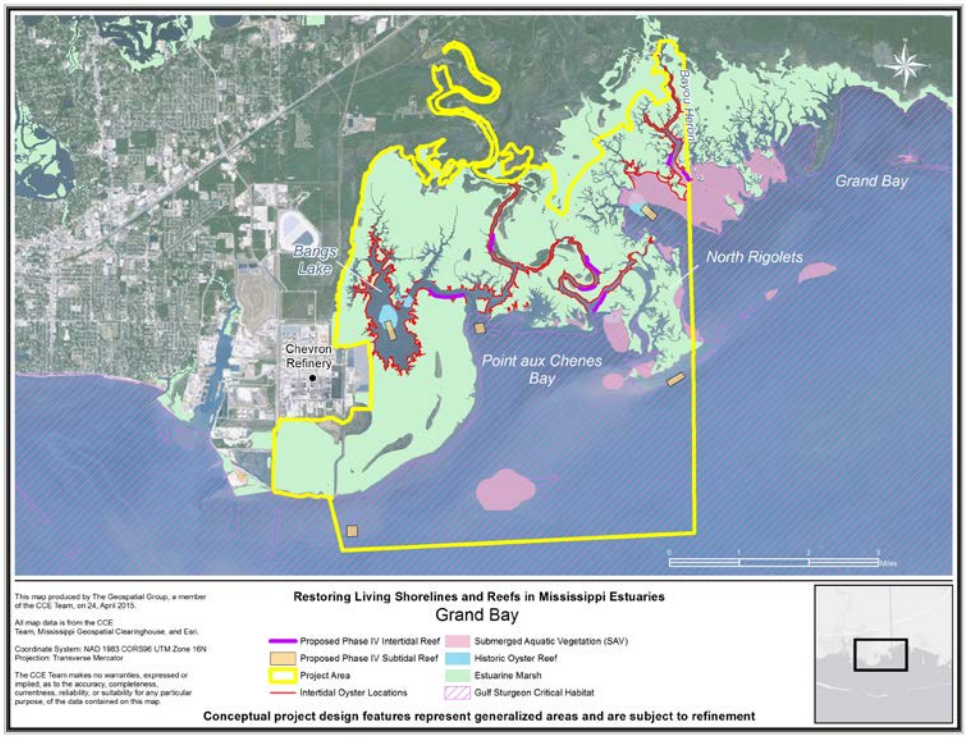
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6.2.7.2 Biological Environment

The Mississippi Sound extends along the southern coasts of Mississippi and Alabama. The Mississippi 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, Back Bay of Biloxi, Pascagoula Bay, Graveline Bay and Grand Bay. The Mississippi Sound is shallow with water depths generally not exceeding 20 ft. 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 per square yard.

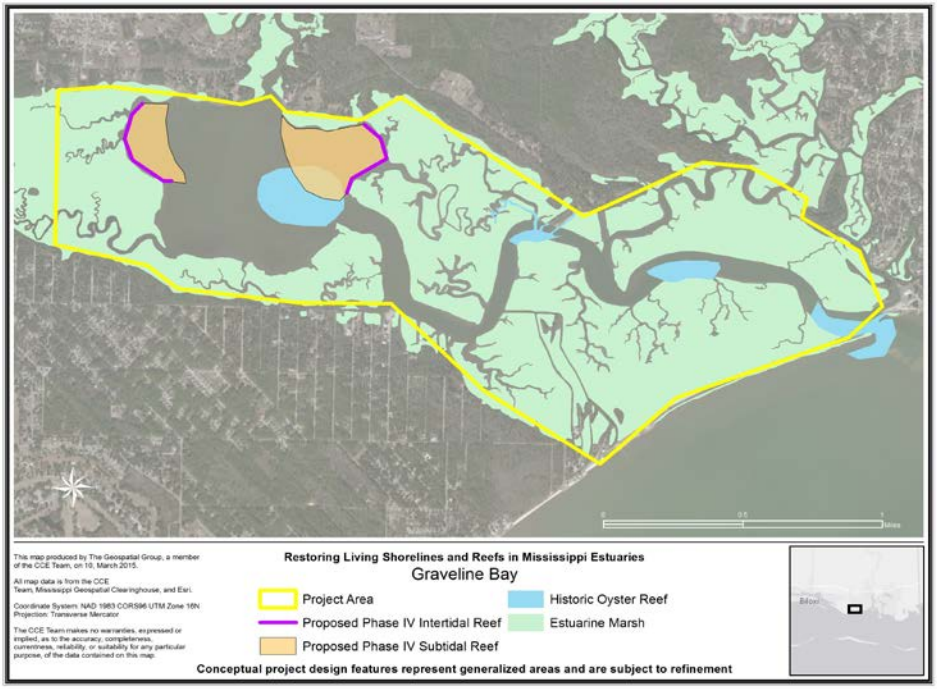
Grand Bay (Jackson County)**:** The Grand Bay National Estuarine Research Reserve/National Wildlife Refuge (NERR/NWR) and Grand Bay Savanna Preserve is a large, pristine, intact estuary which supports a highly diverse floral and faunal community (Figure 6-10). This site, located in southeastern Jackson County, encompasses almost 27,000 acres and is one of the largest estuarine systems in Mississippi. The Grand Bay area lies within the gently sloping, lower Gulf coastal plain and was part of the previous deltas of the Escatawpa and Pascagoula rivers. A mosaic of coastal habitat types extend from near Interstate 10 south for 10 miles to the open waters of the Mississippi Sound, and for 10 miles from near the Chevron Refinery in the west to Isle aux Dames, Alabama, to the east. This broad mosaic of estuarine and non-estuarine wetland habitats forms a largely intact coastal watershed. The open-water estuarine areas support declining oyster reefs and extensive SAV habitats. The intertidal portion of the site includes a wide variety of marsh types (low, mid-level and high elevation zones across a wide range of salinity). The coastal marshes are also among the most extensive and productive in the state. The non-tidal areas include wet pine savanna, coastal bayhead and cypress swamps, freshwater marshes and maritime forests.

Figure 6-10. Habitats in the Grand Bay



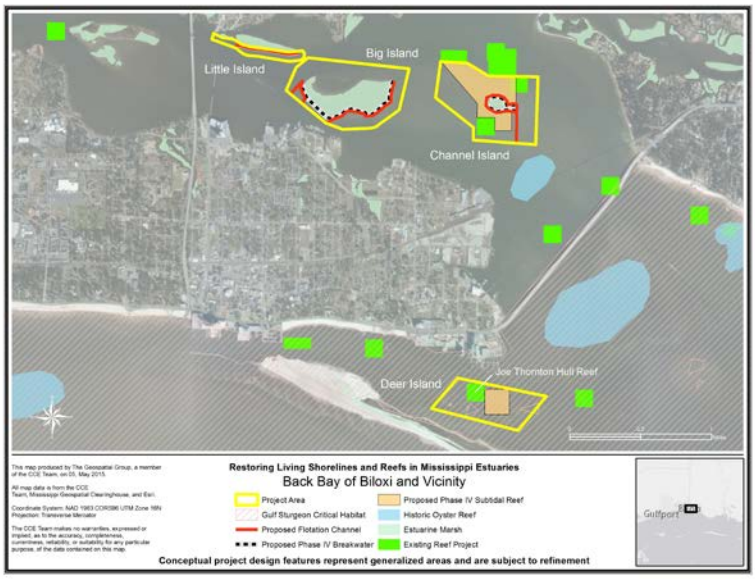
Graveline Bay (Jackson County): Graveline Bay and waterways represent one of only a few relatively undisturbed estuarine bays and small tidal creeks in Mississippi (Figure 6-11). The area supports salt marsh, brackish marsh, and several degraded oyster beds. This shallow, coastal bay/marsh estuarine system receives only local freshwater runoff and consists largely of mid-level needle rush (*Juncus roemerianus*) dominated marsh along its entire length. Smooth cordgrass (*Spartina alterniflora*) occurs largely as narrow (1 to 3 m) bands along the waterways. Subtidal ecological communities/habitats include muddy sand embayment, small tidal creeks and mollusk reefs. Intertidal ecological communities/habitats include sand beach, mesohaline marsh, and oligohaline marsh. Much of the marsh area is already part of the MDMR Coastal Preserve Program.

Figure 6-11. Habitats in Graveline Bay



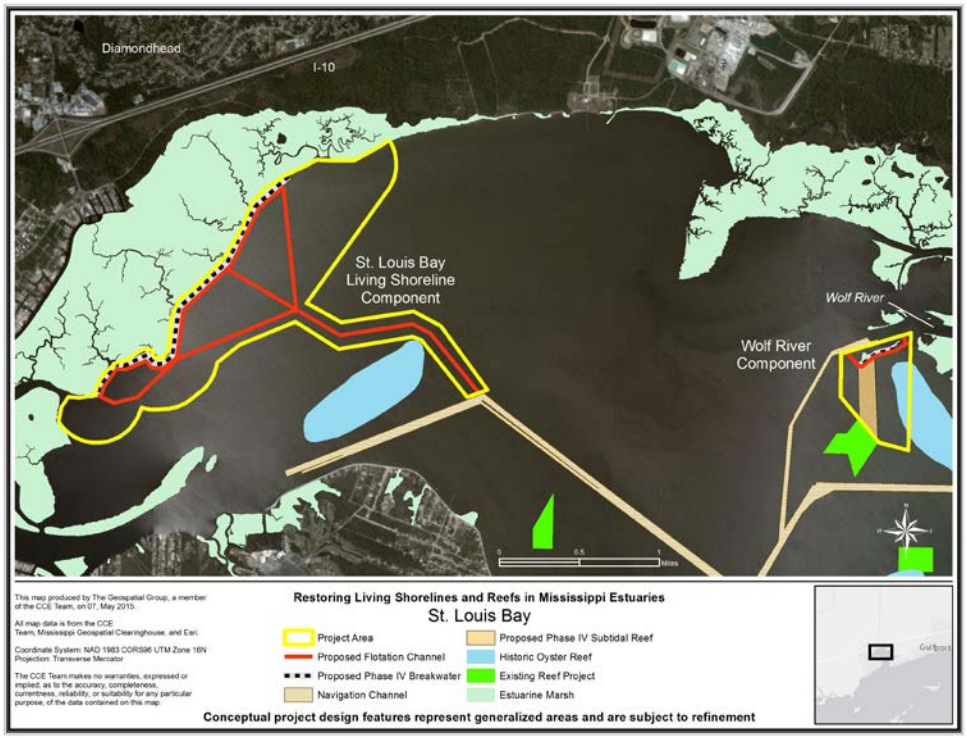
Back Bay of Biloxi (Jackson and Harrison County): The Back Bay of Biloxi is an estuarine bay that receives freshwater from the Biloxi and Tchoutacabouffa rivers as well as numerous tidal streams and bayous that drain local areas (Figure 6-12). It is surrounded by a mix of industrial, commercial and residential properties with large amounts of hardened shorelines. Portions of the shoreline of western Back Bay of Biloxi are within the Biloxi River Coastal Preserve maintained by MDMR. Navigation channels are in use throughout the entire bay, and have high traffic volume. As such, the water in Back Bay of Biloxi is turbid and in general is not conducive to SAV growth. The project area islands are composed primarily of black needle rush (*Juncus roemerianus*) marsh. Smooth cordgrass (*Spartina alterniflora*) occurs as narrow, disjunct bands along low marsh fringes.

Figure 6-12. Habitats in the Back Bay of Biloxi and Vicinity



St. Louis Bay (Harrison and Hancock County): St. Louis Bay is a coastal bay and estuary on the Mississippi Gulf Coast and contains some of few remaining expansive salt marsh ecosystems in Mississippi (Figure 6-13). The Jourdan and Wolf rivers are the two major systems that enter the bay and drain approximately 523,000 acres. Other notable water bodies that drain into St. Louis Bay are Bayou LaCroix from the west and Bayou Portage from the east. Several hundred acres of marsh and upland habitats that flank the mouths of the Wolf and Jourdan rivers are part of the MDMR Coastal Preserves Program. The estuarine marsh south of the city of Diamondhead represents over 1,000 acres of continuous tidal marsh and is the largest habitat of this type in the estuary.

Figure 6-13. Habitats in St. Louis Bay



Living Coastal and Marine Resources includes a discussion of SAVs, invasive species, nearshore benthic invertebrates, marine mammals, protected species, migratory birds, and essential fish habitat.

6.2.7.2.1 Living Coastal and Marine Resources

Submerged Aquatic Vegetation (SAVs)

Affected Environment

The project components are entirely in shallow open water environments. In general the areas where structures would be placed are soft bottom areas or remnant oyster reef or artificial reef areas devoid of vegetation.

Grand Bay Project (Jackson County): Large SAV beds exist in the Grand Bay estuary and are monitored by the Grand Bay NERR staff at various locations annually. The last mapping effort took place in 2010 (Figure 6-10) in which a total of 530 acres were documented. The beds are typically patchy with shoal grass (*Halodule wrightii*) and widgeongrass (*Ruppia maritima)* sharing dominance. Macroalgae and epiphytes are documented in the annual transect surveys conducted by Grand Bay NERR staff.

Back Bay of Biloxi and Vicinity (Jackson and Harrison County): Surveys completed in 2010 found evidence of SAVs further upstream into the Biloxi River. No SAVs were found near the project areas (Cho, et. al. 2010). The project areas are located in shallow water with soft bottom substrate.

Graveline Bay and St. Louis Bay Project Components (Jackson, Harrison, and Hancock County): The project components in these bays would be situated near eroded shoreline and on soft bottom substrate. SAV beds are not likely present in these areas. There is no known survey of these areas for SAVs, but the waters are turbid and do not support large, continuous beds.

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.5 of the Final Phase III ERP/PEIS describe the impacts to habitats from early restoration project types 2 and 6. These project types are expected to result in short-term minor to moderate adverse impacts to habitat as a result of construction activities. Adverse impacts could include: increased soil erosion, vegetation damage or removal, changes in water quality from turbidity and substrate disturbance from in-water work, and the potential introduction or opportunity for establishment of invasive species. Long-term minor to moderate adverse impacts could occur to habitats adjacent to new breakwaters or other shoreline protection structures as they could change natural current patterns, sediment accretion and erosion rates. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts to SAVs. There would be no long-term benefits by creation of protected areas which could be conducive to SAV growth. No mitigation measures would be necessary.

Proposed Action

Due to the eroded environment, turbid waters, and soft bottom substrate, SAV beds are not anticipated within the St. Louis Bay, Back Bay, and Graveline Bay Project components. The Grand Bay Project component area is more likely to have some SAV beds. Prior to construction activities, SAV surveys would be completed in the project component areas. If any SAV beds are found, the project would be modified to avoid the beds if possible. Even with surveys prior to construction, the deployment of the reef material in the Grand Bay Project component area could result in short-term, minor, adverse impacts to SAVs in the vicinity of the project resulting from temporary sedimentation in beds. Any disturbance would temporary in nature; it is anticipated that SAV beds would recover naturally. Construction of the breakwaters in St. Louis Bay and Back Bay could provide or protect areas conducive to SAV growth which could provide long-term benefits as established or ephemeral SAV beds in these waterbodies.

The Final Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review would result in the avoidance and minimization of impacts to SAVs:

- To the extent practicable, SAVs would be avoided in the siting and construction of breakwaters, intertidal habitat, subtidal habitat and temporary flotation channels.

Invasive Species

Affected Environment

The potential introduction of terrestrial and aquatic non-native invasive species of plants, animals, and microbes is a concern for any proposed project. Non-native invasive species could alter existing terrestrial or aquatic ecosystems, may cause economic damages and losses, and are the second most common reason for protecting species under the Endangered Species Act. The species that are or may become introduced, established, and invasive are difficult to identify. The analysis focuses on pathway control or actions/mechanisms that may be taken or implemented to prevent the spread of invasive species on site or introduction of species to the site. Surveys have not been conducted to determine if invasive species are present.

Environmental Consequences

Programmatic Review

Sections 6.3.2.5 of the Final Phase III ERP/PEIS describe the impacts to habitats from early restoration project types 2 and 6. Construction activities related to placement of breakwaters or other shore protection systems could result in introduction of invasive species during construction activities, e.g., through transport on construction equipment. However, the use of BMPs would help prevent the introduction of invasive species. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts which would result in the introduction of invasive species. No mitigation measures would be necessary.

Proposed Action

This project involves placement of breakwater, reef material, and dredging of temporary flotation channels. A variety of in-water construction equipment would be used. Each of these actions and pieces of equipment serve as a potential pathway to introduce or spread invasive species. BMPs would be implemented to ensure these pathways are “broken” and do not spread or introduce species (see BMPs listed below). The implementation of these BMPs meets the spirit and intent of EO 13112. Due to the implementation of BMPs, the Trustees expect risk from invasive species introduction and spread to be short-term and minor.

The Final Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review would result in the avoidance and minimization of the introduction and spread of invasive species:

- All equipment to be used during the project, including personal gear, would be inspected and cleaned such that there is no observable presence of mud, seeds, vegetation, insects and other species.
- Reef habitat material would be treated or inspected to remove "non-target" species.

Nearshore Benthic Invertebrates

Affected Environment

Benthic Infauna and Epifauna

Oysters are important as both organisms and habitat with an integral role in the functioning of the ecosystem. The aggregations of oysters that comprise an oyster reef result in a complex and hard substrate that provides habitat for multiple benthic organisms and fish, increasing biodiversity in estuaries. Within an oyster reef community more than 300 other macrofauna species may also be present. Oysters are an ecological keystone species in most estuaries along the Atlantic and Gulf coasts, and oyster populations contribute to the integrity and functionality of estuarine ecosystems.

Nearshore benthic communities in the Gulf are largely composed of macroinvertebrate groups such as mollusks, sponges, polychaetes, corals, and crustaceans. These groups are diverse and are found in Gulf habitats spanning from the intertidal zone to the soft sediments on the continental shelf. Benthic communities perform important ecological functions in the nearshore food web, and several groups (e.g., lobster, shrimp, and crabs) are also commercially important. Sponges, mollusks, arthropods (including crustacea), and polychaetes are all important taxa and contribute substantially to benthic biomass. These taxa include many filter-feeding species, which remove and digest phytoplankton and particulate organic matter and deposit processed materials to the substrate (Felder and Camp 2009). Benthic fauna are often habitat forming and provide habitat and nursery areas for fish and crevices for mobile invertebrates to seek shelter; they also harbor diverse microbial communities (Taylor et al. 2007). Mollusks and crustaceans, including both shrimp and crab, are important ecologically and commercially throughout the Gulf region.

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.6 of the Final Phase III ERP/PEIS describe the impacts to living coastal and marine resources from early restoration project types 2 (Protect Shorelines and Reduce Erosion) and 6 (Restore Oysters). These project types would result in short-term and long-term minor to moderate adverse impacts to living coastal and marine resources as a result of restoration construction activities. Project types that include in-water work or dredging could affect oyster populations and other benthic organisms from increased turbidity and siltation, which may increase mortality and inhibit spawning

activities. Increased turbidity could limit available light necessary for photosynthesis, and disruption in the water column and surface water could disturb or kill some pelagic microfaunal organisms. These project types could also result in long-term benefits by providing habitat to living coastal and marine resources. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts to nearshore benthic invertebrates. No mitigation measures would be necessary. There would be no creation of intertidal or subtidal reef habitat for nearshore benthic invertebrates.

Proposed Action

A brief summary of impacts from breakwater construction, intertidal and subtidal habitat deployment and construction of temporary flotation channels is provided here.

Breakwater construction: Breakwater deployments would occur near eroded shorelines and would have little effect on oysters, infauna, or epifauna. Short-term minor impacts to local oyster populations or other benthic organisms may occur from increased turbidity, substrate disturbance, or siltation during construction. Mollusks and crustaceans such as shrimp and crab are likely limited in soft-sediment areas where construction would occur. These mobile invertebrates would experience a short-term minor impact and a long-term benefit due to the placement of hardened structure. The project would result in 17.9 acres of soft bottom habitat that would be replaced by a three-dimensional breakwater that would be colonized by oysters, infauna, and other epifauna. The zone between the breakwater and the existing eroded shoreline would also become a more stable soft-bottom habitat for these species. This represents a long-term benefit for these organisms.

Intertidal and subtidal reef habitat deployment: Subtidal reef habitat would be placed on or adjacent to existing or historic intertidal or subtidal reef habitat. Reef material deployment would result in short-term minor adverse impact to remnant hard-surface bottom habitat and/or colonized reefs in the project area. Approximately 267 acres of subtidal reef and five acres of intertidal reef deployment would result in colonization over a two-to-five-year period. Development of the reefs represents a long-term benefit to the infauna and epifauna that typically colonize subtidal reefs. These mobile invertebrates would experience a short-term minor impact and a long-term benefit due to the placement of hardened structure.

Construction of Temporary flotation channels: Construction would temporarily displace sediment-dwelling invertebrates in 85.3 acres. The impact would be short-term and minor. Temporary flotation channels, if needed, would be filled in upon completion of the project and would likely be recolonized by existing organisms in nearby sediments.

The Final Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review procedures would result in the avoidance and minimization of impacts to oysters, infauna and epifauna:

- SAV surveys and where needed oyster/hard bottom and artificial/nearshore reef surveys would be conducted as part of project site refinement.
- For breakwaters, intertidal reef habitat, subtidal reef habitat, and temporary flotation channels effort would be made during design and construction to avoid existing environmentally sensitive areas such as viable productive oyster reefs, emergent marsh and SAVs, and other living communities.
- Temporary flotation channel dimensions (e.g., length, depth and width) be minimized and to the extent practicable, avoided depending on project design and/or construction timing.

Marine Mammals

Affected Environment

Marine mammals found within the Gulf of Mexico include 21 species of cetaceans (whales and dolphins) and the West Indian manatee. The Marine Mammal Protection Act (MMPA) prohibits the "taking" of marine mammals incidental to a specified activity, unless such taking is appropriately authorized.

Dolphin Species

The bottlenose dolphin, *Tursiops truncatus*, and the Atlantic spotted dolphin, *Stenella frontalis*, are the two most common marine mammals found in the Gulf of Mexico. Both species feed primarily on fish, squid and crustaceans. While *S. frontalis* spends the majority of its life offshore, *T. truncatus* often travels into coastal bays and inlets for feeding and reproduction.

West Indian Manatee

The West Indian manatee (*Trichechus manatus latirostris*) is listed as endangered under the ESA. The species is endangered due to its small population size (less than 2,500 mature individuals with possible population decline), the possibility of at least a 50 percent future reduction in population size, and near- and long-term threats from human-related activities (USFWS 2013, Mississippi Department of Wildlife Fisheries and Parks [MDWFP] 2001). Between October and April, manatees concentrate in areas of warmer water. During summer months, the species may migrate as far west as the Louisiana and Texas coast on the Gulf of Mexico. Manatees inhabit both salt and fresh water of sufficient depth (about 5 feet to usually less than 18 feet). Manatees will consume any aquatic vegetation available to them including sometimes grazing on the shoreline vegetation.

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.6 of the Final Phase III ERP/PEIS describe the impacts to living coastal and marine resources from early restoration project types 2 (Protect Shorelines and Reduce Erosion) and 6 (Restore Oysters). Implementation of these project types could result in short-term, minor to moderate impacts because of possible displacement of marine mammals from the work area due to increase in activity, noise, vibration, and turbidity during construction. These impacts would only affect localized areas. BMPs are expected to avoid or minimize these impacts. If projects have potential for incidental

harassment of marine mammals or adverse effects to ESA-listed marine mammals or sea turtles, authorizations and consultations with appropriate agencies would be required prior to project implementation. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/ PEIS.

No Action

Under the No Action alternative, there would be no impacts to marine mammals. No mitigation measures would be necessary.

Proposed Action

Noise and other activity associated with proposed construction may temporarily disturb certain dolphin species and manatee in the vicinity of the project area through temporary impacts on prey abundance, water quality (turbidity), and underwater noise, and may temporarily increase the potential for boat collisions with certain species in the project area. However, the mobility of these species reduces the risk of injury due to construction activity. Based on the mobility of these species, the short duration of construction activities, and the proposed construction methodology, effects on dolphin species and manatees are not anticipated. The Trustees evaluated the potential for incidental take of marine mammals. The proposed project is located in shallow estuarine waters and will not involve construction methodologies known to impact marine mammals.

The Final Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review procedures would result in the avoidance and minimization of impacts to marine mammals:

- Standard Manatee Conditions (A-D) for In-Water work (USFWS 2011)
- Sea Turtle and Smalltooth Sawfish aConstruction Guidelines (NMFS 2006)
- Measures for Reducing Entrapment Risk to Protected Species (NMFS 2012)

Protected Species

Affected Environment

The U.S. Fish and Wildlife Service (USFWS) lists species as threatened or endangered when they meet criteria detailed under the ESA of 1973, as amended (16 U.S.C. §1531 et seq.). Additionally, MDWFP and NOAA National Marine Fisheries Service (NMFS) identify and list protected species. Section 7(a) (2) of the ESA requires that each federal agency ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of those species. When the action of a federal agency may affect a protected species or its critical habitat, that agency is required to consult with either the NMFS or the USFWS, depending upon the protected species that may be affected. To fulfill requirements and obligations under ESA and Marine Mammal Protection Act (MMPA), NOAA is reviewing and DOI completed a review of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project for compliance with Section 7 of the ESA of 1973 , as amended (16 U.S.C. 1531 et seq.) and Section 101 of the MMPA of 1972, as amended (16 U.S.C. 1371(a)(5) et seq.). Biological Evaluation forms were submitted

to the USFWS for consultation and coordination on the ESA, MBTA and BGEPA (DOI 2015) and to NMFS for ESA (NOAA 2015). The USFWS local field office concurred by letter dated August 24, 2015. See Phase IV ERP/EA Chapter 6, sections 6.2.7.2.1. The Trustees are awaiting NMFS SERO's response on ESA. The Trustees coordinated with NMFS SERO's Protected Resources Division to determine that this project does not require authorization under the MMPA. The Migratory Bird Treaty Act (MBTA) compliance and Bald and Golden Eagle Protection Act (BGEPA) are also discussed in this section.

T

Relevant federally protected species that are known to occur or could occur in Hancock County, Harrison County, or Jackson County are listed in Table 6-7. However, only the piping plover, red knot, five sea turtle species, Gulf sturgeon, West Indian manatee and Alabama red-bellied turtle are likely to occur in or near the project area or could pass through the project area. A brief discussion of the state imperiled diamond back terrapin is also provided in the environmental consequences.

Table 6-7. Restoring Living Shorelines and Reefs in Mississippi Estuaries — Federally threatened, endangered, and proposed species

Common Name	Scientific Name	Federal Status	County	Habitat
Birds				
Piping Plover	*Charadrius melodus*	Threatened	Jackson, Harrison	Beaches and mudflats in southeastern coastal areas. Critical Habitat, MS-15, exists in Jackson County
Red Knot	*Calidris canutus rufa*	Threatened	Jackson, Harrison	Marine intertidal habitats including inlets, estuaries, and bays feeding in mud and sand flats on beaches and barrier islands
Fishes				
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	Threatened	Jackson, Harrison, Hancock	Migrates from large freshwater coastal rivers to brackish and marine coastal bays and estuaries. The Deer Island Subtidal Reef and the Grand Bay Intertidal and Subtidal Reef project components have structures within Critical Habitat Unit 8
Mammals				
West Indian Manatee	*Trichechus manatus*	Endangered	Jackson, Harrison, Hancock	Fresh and salt water in large coastal rivers, bays, bayous and estuaries
Reptiles				
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered	Jackson, Harrison, Hancock	Coral reefs, open ocean, bays, estuaries
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered	Jackson, Harrison, Hancock	Open ocean, coastal waters
Kemp's ridley Sea Turtle	*Lepidochelys kempii*	Endangered	Jackson, Harrison, Hancock	Nearshore and inshore coastal waters, often in salt marshes; neritic zones with muddy or sandy substrate (NOAA Fisheries 2014b)
Green Sea Turtle	*Chelonia mydas*	Threatened	Jackson, Harrison, Hancock	Shallow coastal waters with SAVs and algae, nests on open beaches
Loggerhead Sea Turtle	*Caretta*	Threatened	Jackson, Harrison, Hancock	Open ocean; also inshore areas, bays, salt marshes, ship channels and mouths of large rivers

Common Name	Scientific Name	Federal Status	County	Habitat
Alabama Red-belly Turtle	*Pseudemys alabamensis*	Endangered	Jackson, Harrison	Fresh and brackish habitats, river banks, submerged and emergent aquatic vegetation; upland habitat for nesting (MDWFP 2001; USFWS 2013)

Birds

Piping Plover (*Charadrius melodus*): The piping plover does not nest in Mississippi; however, this species uses Gulf Coast beaches and barrier islands for wintering (MDWFP 2001). Plovers use sparsely vegetated sand beaches, mudflats, and salt marshes for roosting and foraging. Piping plover critical habitat MS-15 occurs in the vicinity of the Grand Bay Intertidal and Subtidal Reefs project component but does not occur within the conceptual project footprint.

Red Knot (*Calidris canutus rufa*): In coastal Mississippi, the red knot is mainly a migratory species that uses coastal beaches and marine intertidal areas as stopover feeding locations or staging areas on the way to and from their wintering grounds in South America and breeding areas in the Arctic. Foraging on ocean beaches, mud and sand flats, and salt marshes occurs from March to April during the northward spring migration and September and October during the southward autumn migration (Niles et al. 2007; USFWS 2013). Red knots have been observed wintering on the Gulf Coast and are observed from October to March (USFWS 2013). The nonbreeding diet of this species includes marine invertebrates such as snails, crustaceans, and small mollusks including the coquina clam *(Donax variabilis),* which is common on Gulf coast beaches, and the dwarf surf clam *(Mulinia lateralis)* (Niles et al. 2007; USFWS 2013). Roosting and resting habitat includes areas above the high tide line such as reefs and high sand flats (USFWS 2013).

Fishes

Gulf Sturgeon (*Acipenser oxyrinchus desotoi*): This anadromous species migrates from coastal bays and estuaries to large coastal rivers in the spring for spawning and then returns to brackish and marine environments from October through March for foraging. The riverine spawning habitats for sturgeon in the State of Mississippi include the Mississippi, Pearl, and Pascagoula rivers (Ross et al. 2009; MDWFP 2001) but not the Biloxi and Tchoutacabouffa rivers (USFWS, GSMFC, and NMFS 1995; NMFS and USFWS 2009). The marine wintering areas where individuals have been observed are nearshore and barrier island habitats from the Pearl River east to the barrier islands (Ross et al. 2009). Winter habitat is mainly around Cat, Ship, Horn, and Petit Bois islands with nearshore observations likely due to migratory movements to and from these offshore islands (Rogillio et al. 2007; Ross et al. 2009). The coastal Mississippi Sound waters of the State of Mississippi are designated as critical habitat.

Gulf Sturgeon Designated Critical Habitat

The Deer Island Subtidal Reef project component and portions of the Grand Bay Intertidal and Subtidal Reef project components fall within Gulf sturgeon critical habitat (Unit 8-Lake Ponchartrain-Mississippi Sound). Critical habitat was designated in 2003 by the National Marine Fisheries Service (NMFS) and was based on seven primary constituent elements (PCEs) essential for its conservation. The proposed project

component areas contains four PCEs. The PCEs include abundance of prey items, water quality, sediment quality, and safe and unobstructed migratory pathways. The Trustee is working with NMFS to ensure that the project would not adversely affect any of the PCEs identified.

Mammals

West Indian Manatee (*Trichechus manatus*): This species uses both fresh and saltwater habitats such as coastal rivers, bays, bayous, and estuaries. The manatee is an occasional visitor to Mississippi's coasts, although migration into the area is poorly understood. After wintering in Florida, and perhaps Mexico, manatees migrate northward during spring, including to Mississippi and Alabama waters, although these migrations are not well understood (Fertl et al. 2005). Manatees frequently seek out freshwater sources such as rivers and river mouths and have been known to be found near estuaries (Fertl et al. 2005). SAVs are the typical manatee forage material; however, manatees can also consume other aquatic vegetation, algae, and terrestrial vegetation (Fertl et al. 2005). Given the siting of the project components to avoid SAV beds, any manatee occurrence is expected to be transitory.

Reptiles

Hawksbill Sea Turtle (*Eretmochelys imbricata*): Although this species uses various habitats such as the open ocean, bays, and estuaries throughout different life stages, it is mainly associated with coral reefs. This species nests in Florida from April to November (NOAA Fisheries 2014a). It likely does not nest in Mississippi and observations are rare in the state (MDWFP 2001; NOAA Fisheries 2014a). The main dietary items of this species are sponges and other invertebrates (NOAA Fisheries 2014a).

Leatherback Sea Turtle (*Dermochelys coriacea*): This species mainly inhabits the offshore open ocean; however, it does use nearshore coastal waters during nesting or feeding. Nesting for this species occurs in Florida from April through November. Their main forage item is jellyfish. This species migrates long distances from nesting to feeding areas. While not common, there have been sporadic observations of leatherback sea turtles in Mississippi waters (MDWFP 2001).

Kemp's ridley Sea Turtle (*Lepidochelys kempii*): Typical habitat for this species includes nearshore and inshore coastal waters and often salt marshes and neritic zones with muddy or sandy substrate (NOAA Fisheries 2013b). This species has been observed in nearshore waters of the Mississippi Sound during migration and foraging and has been accidentally caught by shore-based fishermen (MDWFP 2001; Shaver and Rubio 2008). Females typically nest from May through July (NOAA Fisheries 2014b). Males potentially use Gulf of Mexico habitats all year and females presumably use the Mississippi Sound and barrier island habitats for foraging when not nesting (NOAA Fisheries 2014b). Kemp's ridley sea turtles do not nest in Mississippi (MDWFP 2001).

Green Sea Turtle (*Chelonia mydas*): This species typically prefers shallow coastal waters with SAVs and algae for foraging and nests on open beaches (NOAA Fisheries 2015). Nesting typically does not occur on mainland beaches and there is likely no Mississippi nesting at all (MDWFP 2001; NOAA Fisheries 2015). This species migrates long distances in the open ocean from nesting to feeding areas. Observations of this species in Mississippi are rare (MDWFP 2001).

Loggerhead Sea Turtle (*Caretta caretta*): Loggerhead habitat for foraging and migration includes open ocean, inshore areas, bays, salt marshes, ship channels, and mouths of large rivers. This sea turtle feeds on mollusks, fish, crustaceans, and other marine organisms. This species typically nests at night from late April through September (NOAA Fisheries 2014c). Although loggerheads occasionally use barrier islands for nesting, mainland nesting is rare (MDWFP 2001). Preferences for nesting beaches include high-energy coarse-grained beaches adjacent to the ocean that are narrow and steeply sloped (NOAA Fisheries 2014c). This species has been observed in nearshore waters of the Mississippi Sound during migration and foraging and has been accidentally caught by shore-based fishermen (MDWFP 2001).

Alabama Red-Belly Turtle (*Pseudemys alabamensis*): The habitat of the Alabama red-belly turtle includes fresh and brackish habitats, river banks, submerged and emergent aquatic vegetation, and upland habitat for nesting (MDWFP 2001; USFWS 2013). Within the project component vicinities, individuals of this species are known to be present in the Tchoutacabouffa River, the Biloxi River, and the Back Bay of Biloxi (MDWFP 2001; USFWS 2013); however, this species is mainly a freshwater species associated with river and stream channels and associated wetlands. Nesting occurs from mid-May to mid-July (MDWFP 2001).

Mississippi Diamondback Terrapin (*Malaclemys terrapin pileata*): The Mississippi diamondback terrapin (*Malaclemys terrapin pileata*) utilizes pocket beaches adjacent to marsh for nesting habitat (Frey 2014). Diamondback terrapins have a diet of fish, snails, worms, clams, crabs and marsh plants and live in brackish water habitats such as estuaries and tidal marshes, preferring marshes with nearby channels. Juveniles may spend first few years under mats of flotsam or vegetation (Ernst et al. 1994). Clutches are laid from April to August. The Mississippi diamondback terrapin is ranked by the MDWFP as S2: Imperiled in Mississippi (Mississippi Natural Heritage Program 2015). In constructing project components pocket beaches would be avoided to the extent practicable.

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.6 of the Final Phase III ERP/PEIS describe the impacts to living coastal and marine resources from early restoration project types 2 (Protect Shorelines and Reduce Erosion) and 6 (Restore Oysters). These project types would result in short-term minor to moderate adverse impacts to living coastal and marine resources as a result of restoration construction activities. Sensitive species such as sea turtle and marine mammals present in project areas where dredging or underwater use of equipment is occurring could be subject to temporary increased noise, turbidity, and water quality changes as well as alteration or loss of forage or nesting habitat, which could temporarily displace individuals or prey. These project types would create and restore habitat, reduce erosion, improve water quality, protect wildlife and would have long term benefits for a variety of aquatic and terrestrial species. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts to endangered species. No mitigation measures would be necessary. There would be no habitat benefits to aquatic and terrestrial species which would benefit protected species.

Proposed Action

Potential impacts to threatened or endangered species and their critical habitat are presented in Table 6-8 including the piping plover, red knot, five sea turtle species, Gulf sturgeon, Alabama red-belly turtle, and West Indian manatee.

Table 6-8. Protected Species Impacts

Species /Critical Habitat	Applicable Project Area/Project Components	Potential Impacts to Species/Critical Habitat
Green sea turtle *(Chelonia mydas)*	All	While not likely to be impacted, sea turtles are a mobile marine species and project activities would not impede transitory routes. There is no nesting habitat in the project area. There is no designated or proposed critical habitat for sea turtles within the action area. If individuals enter construction areas, construction would be halted and could result in short-term, minor impacts.
Hawksbill sea turtle *(Eretmochelys imbricata)*	All	
Kemp's ridley sea turtle *(Lepidochelys kempii)*	All	
Leatherback sea turtle *(Dermochelys coriacea)*	All	
Loggerhead sea turtle *(Caretta caretta)*	All	
Alabama Red-Belly Turtle (*Pseudemys alabamensis*)	Back Bay; Channel Island Living Shoreline; Big Island Living Shoreline; Little Island Living Shoreline	This species is a concern in the Back Bay of Biloxi. Alabama red-belly turtle habitat includes fresh and brackish waters, river banks and uplands, and submerged and emergent aquatic vegetation Due to the brackish conditions and lack of SAVs for foraging at the project site it is unlikely that the species would be present in the in the project area and that impacts would occur.
Piping plover *(Charadrius melodus)* and red knot (*Calidris canutus rufa*)	Grand Bay Intertidal and Subtidal Reefs	Piping plover are not known to use the action area, however; they could be present between August and May. In coastal Mississippi, the red knot is mainly a migratory species that uses coastal beaches and marine intertidal areas as stopover feeding locations or staging areas from March to April during the northward spring migration and September and October during the southward autumn migration (Niles et al. 2007; USFWS 2013). If an individual enters the project area and is disturbed, it is expected that they would be able to move to another nearby location (within their normal daily movement pattern) to continue foraging, feeding and resting. If individuals of either species are within 150 feet of the construction area, work will stop until the individual(s) leave of their own volition. The project will be implemented to ensure no effects to the PCEs of nearby

Species /Critical Habitat	Applicable Project Area/Project Components	Potential Impacts to Species/Critical Habitat
		piping plover are impacted.
West Indian manatee *(Trichechus manatus)*	All	West Indian manatees are not likely to occur in the project area. Short-term minor impacts could occur if manatees come into contact with construction activities. Manatees are a mobile marine species and project activities would not impede transitory routes. If individuals are within 50 feet of construction areas, construction would be halted until the individual leaves the area of its own volition.
Gulf sturgeon *(Acipenser oxyrhynchus desotoi)* (Designated Critical Habitat)	Grand Bay Intertidal and Subtidal Reefs; and Deer Island Intertidal Reef	The project is in designated critical habitat. To the extent practicable, project construction at the Deer Island Subtidal Reef and the Grand Bay Intertidal and Subtidal Reef project components would be limited to the window between May and October, after sturgeon have migrated to their riverine habitat. If work continues beyond the May to October window, continued adherence to the Sea turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) would minimize the potential for impacting Gulf sturgeon. No project components are located within riverine ecosystems. If individuals enter construction areas, short-term, minor impacts could be the result. PCEs for Gulf sturgeon would not be adversely modified by the proposed project.
Mississippi diamondback terrapin (*Malaclemys terrapin pileata*)	All	The proposed project could contain nesting habitat. In order to avoid impacting the diamondback terrapin and habitat, the Trustee would identify and also avoid pocket beaches to the maximum extent practicable in the design of the project. Since work would be conducted in shallow water marine environment, impacts to diamondback terrapin and habitat are not anticipated.

The Final Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review would result in the avoidance and minimization of impacts to protected species:

<u>Sea turtles mitigation measures (all project components)</u>

- Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006).
- All project work would be in-water and no nesting habitat exists in the project area.
- All construction personnel would be notified of the potential presence of sea turtles in the water and would be reminded of the need to avoid sea turtles.
- If any sea turtles are found to be present in the immediate project area during activities, construction would be halted until species moves away from project area.
- All construction personnel would be notified of the criminal and civil penalties associated with harassing, injuring, or killing sea turtles.
- Train/instruct all construction personnel of what they are to do in the presence of a sea turtle.

- Construction activities would occur during daylight hours and noise would be kept to the minimum feasible.

Shorebirds mitigation measures (all project components)

- All construction personnel would be notified of the potential presence of shorebirds within the project area.
- All construction personnel would be instructed and trained in the protection of shorebirds.
- Construction personnel would be notified of the criminal and civil penalties associated with harassing, injuring or killing shorebirds.
- If piping plovers or red knots are present, work would not occur until the birds have moved from the area by 150 feet.
- Construction noise would be kept to the minimum feasible.

West Indian manatee mitigation measures (all project components)

- Standard Manatee Conditions (A-D) for In-Water Work (USFWS 2011).
- All construction personnel would be notified of the potential presence of West Indian Manatee in the water and reminded of the criminal and civil penalties associated with harassing, injuring, or killing West Indian manatees. All workers would be educated that there could be West Indian manatees in the water and would be advised to look for manatees and, if observed, wait until manatees leave the area to put the equipment in the water.
- Care would be taken when lowering equipment into the water and the sediment in order to ensure that no harm is caused to West Indian Manatee that may potentially be in the water within the construction area.
- Should a West Indian Manatee come within 50 foot of the project area during construction activities, work would immediately cease until the West Indian Manatee has moved away from the project area on its own. Construction noise would be kept to the minimum feasible.

Gulf sturgeon (Deer Island and Grand Bay project components only)

To the extent practicable, construction of the Deer Island Subtidal Reef and the Grand Bay Intertidal and Subtidal Reefs project components that are in Gulf Sturgeon Critical habitat, would be limited to the window between May and October, after sturgeon have migrated to their riverine habitat. If work continues beyond the May to October window, continued adherence to the Sea turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) would minimize the potential for impacting Gulf sturgeon.

ESA consultations and MMPA coordination (all project components)

To fulfill requirements and obligations under ESA and Marine Mammal Protection Act (MMPA), NOAA is reviewing and DOI completed a review of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project for compliance with Section 7 of the ESA of 1973 , as amended (16 U.S.C. 1531 et seq.) and Section 101 of the MMPA of 1972, as amended (16 U.S.C. 1371(a)(5) et seq.). Biological Evaluation forms were submitted to the USFWS for consultation and coordination on the ESA, MBTA and BGEPA (DOI 2015) and to NMFS for ESA (NOAA 2015). The USFWS local field office concurred by letter dated August 24, 2015. See Phase IV ERP/EA Chapter 6, sections 6.2.7.2.1. The Trustees are awaiting NMFS

SERO's response on ESA. The Trustees coordinated with NMFS SERO's Protected Resources Division to determine that this project does not require authorization under the MMPA. The Migratory Bird Treaty Act (MBTA) compliance and Bald and Golden Eagle Protection Act (BGEPA) are also discussed in this section.

Migratory Birds

Affected Environment

Migratory bird guilds that could have presence in the proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries area include wading birds, shorebirds, seabirds, raptors, goatsuckers, waterfowl, doves and pigeons, and rails and coots (see Table 6-9).

Bald and Golden Eagle Protection Act

The BGEPA of 1940 (16 U.S.C. 668-668c) (BGEPA) prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. BGEPA provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." Golden eagles are not present along the Gulf Coast.

Table 6-9. Migratory Birds Anticipated In The Action Area

Species	Behavior	Species/habitat Impacts
Wading birds (herons, egrets, ibises)	Foraging, feeding, resting, roosting,	Wading birds primarily forage and feed at the water's edge. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily nest and roost in trees or shrubs (e.g. pines, Bacchurus), which occur outside the action area.
Shorebirds (plovers, oystercatchers, stilts, sandpipers)	Foraging, feeding, resting, roosting	Shorebirds forage, feed, rest, and roost in the action area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily nest and roost in the dunes. This project would occur in open water and intertidal zones away from potential shorebird nesting areas; therefore it is not anticipated to impact nesting.
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, roosting	Seabirds forage, feed, rest, and roost in the action area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily roost in the dunes. This project would occur in open water and intertidal zones away from potential nesting areas; therefore it is not anticipated to impact nesting.
Raptors (osprey, hawks, eagles, owls)	Foraging, feeding, resting, roosting	Raptors forage, feed, and rest in the action area. As such, they may be impacted locally and temporarily by the project.

Species	Behavior	Species/habitat Impacts
		It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. Most raptors are aerial foragers and soar long distances in search of food. The areas in the estuary where these birds roost and nest are not within the action area.
Goatsuckers	Foraging, feeding, resting, roosting	Goatsuckers forage, feed, rest, and roost in the action area. However, they are nocturnal/crepuscular and therefore not active during the project work period. They nest in thickets and woodlands, which are not included in the action area.
Waterfowl (ducks, loons, and grebes)	Foraging, feeding, resting, roosting	Waterfowl forage, feed, rest, and roost in the action area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily roost and nest in low vegetation. This project would occur in open water and intertidal zones away from potential nesting areas; therefore it is not anticipated to impact nesting.
Doves and pigeons	Foraging, feeding, resting, roosting	Doves and pigeons could forage, feed, rest, and roost in the action area. However, they are unlikely to utilize habitat in the estuarine zone.
Rails and coots	Foraging, feeding, resting, roosting	Rails and coots forage, feed, rest, and roost in the action area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting if disturbed by the project. These birds primarily roost and nest in marshes, which are within the action area, and adjacent to project activities which are in-water. This project would occur in open water and intertidal zones away from potential areas; therefore it is not anticipated to impact nesting.

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.6 of the Final Phase III ERP/PEIS describe the impacts to living coastal and marine resources from early restoration project types 2 (Protect Shorelines and Reduce Erosion) and 6 (Restore Oysters). Short-term minor displacement of local birds and terrestrial species or mortality of intertidal invertebrates could occur during construction, although most wildlife would be expected to move away to forage in other readily available foraging habitat during this activity. If construction occurs during the nesting season, nests could be destroyed, and chicks or fledglings could be harmed, causing a loss of recruitment and a longer term effect. Construction in terrestrial habitats could result in short-term impacts due to operation and staging of heavy equipment which can create noise, reduce or remove available habitat or disrupt normal movement of wildlife. As such, individual birds or terrestrial wildlife that rest, roost, or forage in or near the work area could be temporarily disturbed or displaced. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts to migratory birds, bald or golden eagles. No mitigation measures would be necessary.

Proposed Action

This project would occur in open water and intertidal zones away from potential nesting areas; therefore it is not anticipated to impact nesting. Pre-construction nesting surveys for migratory birds and raptors on adjacent land would be conducted and if evidence of nesting is found, coordination with the USFWS would be initiated to develop and implement appropriate conservation measures. Due to the implementation of best management practices, no "take" is anticipated. There are no golden eagles in the project footprint. Raptor nest surveys would be completed on adjacent land where raptor nesting habitat exists. No bald or golden eagles are known to nest within 660 ft. of the project area. Thus, no impacts to golden or bald eagles are anticipated. If evidence of nesting is found, coordination with the USFWS would be initiated to develop and implement appropriate conservation measures. Potential adverse effects to birds include elevated noise levels due to the presence of construction equipment. These species are mobile and would likely exit the area during construction (no impacts to overall population). Therefore, impacts are expected to be short-term, localized, and minor.

Due to the implementation of best management practices, no "take" is anticipated.

The Final Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review procedures would result in the avoidance and minimization of impacts to migratory birds including bald and golden eagles:

- If evidence of eagle nesting is found, within 660 ft. of the project area, coordination with the USFWS would be initiated to develop and implement appropriate conservation measures. Due to the implementation of best management practices, no "take" is anticipated.
- If evidence of migratory bird nesting is found, coordination with the USFWS would be initiated to develop and implement appropriate conservation measures.
- Construction noise would be kept to the minimium feasible.

Essential Fish Habitat

Affected Environment

The 1996 Magnuson-Stevens Fishery Conservation and Management Act requires cooperation among NOAA Fisheries, anglers, and federal and state agencies to protect, conserve, and enhance EFH . EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. The designation and conservation of EFH seek to minimize adverse effects on habitat caused by fishing and non-fishing activities. NOAA's Estuarine Living Marine Resources Program developed a database on the distribution, relative abundance, and life history characteristics of ecologically and economically important fishes and invertebrates in the nation's estuaries. NOAA has designated EFH for more than 30 estuaries in the northern Gulf of Mexico for a number of species of finfish and shellfish.

Table 6-10 lists project species, their EFH and substrates, life stages relative to the proposed action and summary impact analysis (GMFMC 2004 and 2005). A brief discussion of relevant species Fisheries Management Plans is provided here.

Red Drum (*Sciaenops ocellatus*) Fishery Management Plan (FMP): In the Gulf, red drum occur in a variety of habitats, ranging from depths of about 130 feet offshore to very shallow estuarine waters. Red drum utilize SAVs, soft bottom, sand/shell, and emergent marsh habitat during all life cycle stages (Table 6-10). They commonly occur in all of the Gulf's estuaries where they are associated with a variety of substrate types including sand, mud, and hardened bottom. Throughout the Gulf, red drum use SAV meadows as nursery and foraging habitat (GMFMC 2004). Estuaries provide habitat for red drum and species that it preys on. The GMFMC considers all estuaries to be EFH for the red drum. Schools of large red drum are common in the deep Gulf waters with spawning occurring in deeper water near the mouths of bays and inlets, and on the Gulf side of the barrier islands.

In general, for all of the project components the red drum fishery is very common. The estuarine zone is used by this species in all life stages. Habitat use is highest for nearshore hard bottoms, nearshore sand/shell, estuarine SAVs, and estuarine soft bottoms (GMFMC 2005). Larvae, juveniles, and young adults spend the majority of their time in estuarine habitats and prey on a large array of species including blue crab eggs and numerous juvenile fish (Table 6-10).

Reef Fish FMP: The reef fish FMP in the area of the proposed action include snappers and groupers. Reef fish utilize a variety of habitats including SAVs, soft bottom, hard bottom, sand/shell, and emergent marsh during their juvenile and adult life cycle stages (Figure 6-10). They are often found as adults associated with coral reef, limestone, hard bottom, and artificial reef substrates. Occasionally adults occur over sand, away from reefs, but these appear to be foraging individuals. There is some evidence that adults have restricted movement and do not display long migrations. Juveniles of many of the reef fish species are located in shallow, inshore areas associated especially with SAV beds and inshore reefs. There is a general tendency for older and larger fish to occur in deeper water extending to the edge of the continental shelf. Reef fish feed on a variety of invertebrates including shrimp, craps, amphipods, octopus, and squid. Larger reef fish also have a tendency to eat small fish and other larger food items (GMFMC 1981).

Reef fish utilize both pelagic and benthic habitats during their life cycle. A planktonic larval stage lives in the water column and feeds on zooplankton and phytoplankton. Juvenile and adult reef fish are typically demersal and usually associated with bottom topographies on the continental shelf that have high relief: i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings. More detail on these habitat types is found in the FMP for Corals and Coral Reefs (GMFMC and SAFMC 1983). However, several species are found over sand and soft-bottom substrates. Some juvenile snapper and grouper such as mutton, gray, lane, and yellowtail snappers and red grouper have been documented in inshore SAV beds, mangrove estuaries, lagoons, and larger bay systems (GMFMC 1981).

The reef fish fishery includes numerous species that utilize the estuarine zone in certain life stages. Most are transitory species and use inshore environments part of the year. Only mutton (*Lutjanus analis*) and gray snapper (*Lutjanus griseus*) use the estuarine zone as adults for feeding. Reef species have the potential to use this zone as early or late juveniles for growth and feeding habitat (Table 6-10).

Coastal Migratory Pelagics FMP: The only species of managed coastal migratory pelagics in the area of the proposed action is Spanish mackerel. Spanish mackerel is jointly managed by the GMFMC and the South Atlantic Fisheries Management Council. Spanish mackerel migrate south during the winter months and return north in the spring to their spawning grounds (GMFMC & SAFMC 1983). Mackerel are opportunistic carnivores and tend to feed on other smaller fishes.

In the area of project components, the Spanish mackerel (*Scomberomorus maculatus*) uses the estuarine zone during the early and late juvenile and adult life stages.

Shrimp FMP: Shrimp use a variety of estuarine and marine habitats in the Gulf of Mexico. Brown shrimp are found within the estuaries to offshore depths of 110 meters (m) throughout the Gulf; white shrimp inhabit estuaries and to depths of about 40 m offshore in the coastal area extending from Florida's Big Bend area through Texas. Brown and white shrimp are generally more abundant in the central and western Gulf.

Brown Shrimp

Brown shrimp range in the Gulf of Mexico from Florida to the northwestern coast of Yucatan. The range is not continuous but is marked by an apparent absence of brown shrimp along Florida's west coast between the Sanibel and the Apalachicola shrimping grounds. In the U.S. Gulf of Mexico, catches are high along the Texas, Louisiana, and Mississippi coasts. Shrimp are typically found as post larvae and juveniles in shallow vegetated habitats (including SAVs, soft bottom, sand/shell, emergent marsh, and oyster reef habitat), and occasionally, in silty sand and non-vegetated bottoms (Table 6-10). Juveniles and sub-adults generally prefer shallow estuaries and marsh edges (plant-water interfaces). Sub-adults migrate from estuaries during outgoing high tides. Adult brown shrimp typically inhabit Gulf waters from the Mean Low Water line to the continental shelf (GMFMC 2005). Post-larvae, early juvenile, and late-juvenile brown shrimp use estuarine habitat for survival. Emergent marsh and marsh edge are particularly important microhabitats for these species, and they use the tidal cycle to enter low emergent marsh adjacent to the shoreline (GMFMC 2004).

White Shrimp

White shrimp are offshore and estuarine dwellers, and are pelagic or demersal depending on their life stage. The eggs are demersal and larval stages are planktonic, and both occur in nearshore marine waters. Post larval white shrimp become benthic upon reaching the nursery areas of estuaries, seeking shallow water with muddy-sand bottoms that are high in organic detritus. Juveniles move from estuarine areas to coastal waters as they mature. Adult white shrimp are demersal and generally inhabit nearshore Gulf waters in depths less than 100 feet on soft mud or silty bottoms (GMFMC 2005). Post-larvae, early juvenile, and late-juvenile white shrimp use estuarine habitat (emergent marsh and soft bottom habitat) for survival (Table 6-10). Emergent marsh and marsh edge are particularly important

microhabitats for these species, and they use the tidal cycle to enter low emergent marsh adjacent to the shoreline (GMFMC 2004) (Table 6-10).

Shrimp fishery species that use the estuarine zone near the project components include two penaeid types: brown and white shrimp (*Farfantepenaeus aztecus* and *Litopenaeus setiferus*). Post-larvae, early juvenile, and late-juvenile shrimp Table 6-10 of both species use estuarine habitat for survival. Emergent marsh and marsh edge are particularly important microhabitats for these species, and they would use the tidal cycle to enter low emergent marsh adjacent to the shoreline (GMFMC 2004). Additionally, brown shrimp are common in oyster reef and SAV habitats.

Highly Migratory Species FMP: EFH for highly migratory species consists of Gulf of Mexico waters and substrates extending from the U.S./Mexico border to the boundary between the areas covered by the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council from estuarine waters out to depths of 100 fathoms.

These areas are connected by currents and water patterns that influence the occurrence of highly migratory species (HMS) at particular times of the year. Due to habitat-specific requirements of each species, EFH for each HMS potentially occurring in the vicinity of the project components is described below (NMFS 2009). The HMS species include scalloped hammerhead shark (*Sphyma lewini*), bonnethead shark (*Sphyma tiburo*), blacktip shark (*Carcharhinus limbatus*), bull shark (*Carcharhinus leucas*), spinner shark (*Carcharhinus brevipinna*), and Atlantic sharpnose shark (*Rhizoprionodon terraenovaee*).

Table 6-10. Restoring Living Shorelines and Reefs in Mississippi Estuaries-EFH Impact By Species

Species	Habitats Utilized	Life stages within the Area of Proposed Action	Grand Bay Project Components (80 acres)	Graveline Bay Project Components (72 acres)	Back Bay of Biloxi Project Components (96.7 acres permanent; 21.7 acres for temporary flotation channels)		St. Louis Bay Project Components (41.2 acres permanent; 63.7 acres for temporary flotation channels)	
					Breakwater	Reef	Breakwater	Reef
Red Drum (*Scianops ocellatus*)	SAVs, soft bottom, hard bottom, sand/shell, emergent marsh	Larvae, post larvae, juvenile, adult, spawning adults	Short term, minor	Short term, minor	Short term, minor	Short term, minor	Short term, minor	Short term, minor
Mutton Snapper (*Lutjanus analis*)	SAVs	Juvenile, adult						
Cubera Snapper (*Lutjanues cyanopterus*)	SAVs, emergent marsh	juvenile						
Gray Snapper (*Lutjanus griseus*)	SAVs, soft bottom, sand/shell, emergent marsh	Post larvae, juvenile, adult,	Short term, minor	Short term, minor	Short term, minor	Short term, minor	Short term, minor	Short term, minor
Lane Snapper (*Lutjanus synagris*)	SAVs, soft bottom, sand/shell	Post larvae, juvenile	Short term, minor	Short term, minor	Short term, minor	Short term, minor	Short term, minor	Short g term, minor
Yellowtail Snapper (*Ocyurus chrysurus*)	SAVs, soft bottom	juvenile	Long term, minor	Long term, minor	Long term, minor	Long term, minor	Long term, minor	Long term, minor

Species	Habitats Utilized	Life stages within the Area of Proposed Action	Grand Bay Project Components (80 acres)	Graveline Bay Project Components (72 acres)	Back Bay of Biloxi Project Components (96.7 acres permanent; 21.7 acres for temporary flotation channels)		St. Louis Bay Project Components (41.2 acres permanent; 63.7 acres for temporary flotation channels)	
Goliath Grouper (*Epinephelus itajara*)	SAVs, hard bottom	juvenile						
Red Grouper (*Epinephelus morio*)	SAVs, hard bottom	juvenile						
Black Grouper (*Mycteroperca bonaci*)	SAVs	juvenile						
Spanish Mackerel (*Scomberomorus maculatus*)	pelagic	Juvenile, adult	Short term, minor	Short term, minor	Short term, minor	Short term, minor	Short term, minor	Short term, minor
Brown Shrimp (*Penaeus aztecus*)	SAVs, soft bottom, sand/shell, emergent marsh, oyster reef	Post larvae, juvenile	Short term, minor	Short term, minor	Short term, minor	Short term, minor	Short term, minor	Short term, minor
White Shrimp (*Penaeus setiferus*	emergent marsh, soft bottom	Post larvae, juvenile	Long term, minor	Long term, minor	Long term, minor	Long term, minor	Long term, minor	Long term, minor

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.5 of the Final Phase III ERP/PEIS describe the impacts to habitats from early restoration project types 2 and 6. These project types are expected to result in short-term minor to moderate adverse impacts to habitat as a result of construction activities. Adverse impacts could include: increased soil erosion, vegetation damage or removal, changes in water quality from turbidity and substrate disturbance from in-water work, and the potential introduction or opportunity for establishment of invasive species. Long-term minor to moderate adverse impacts could occur to habitats adjacent to new breakwaters or other shoreline protection structures as they could change natural current patterns, sediment accretion and erosion rates; alter availability of invertebrate prey; and cause changes to erosion in off-site locations. Gulf Coast habitats would largely experience long-term beneficial impacts through improved health, stability and resiliency of habitats, including sensitive habitats such as wetlands, barrier islands, areas of SAVs, and reefs. These project types could help reestablish native plant communities, stabilize substrates and support sediment deposition, strengthen shorelines, and reduce erosion. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts to EFH. No mitigation measures would be necessary. There would be no long-term benefits from the creation of breakwaters, intertidal and subtidal reef habitats.

Proposed Action

During construction of the breakwaters and reefs, the fine-grained soft bottom habitat would be altered by the placement of materials. The footprint of the project is approximately 375.3 acres (Table 6-11). Approximately 17.9 acres would be filled for breakwater construction, 267 acres for subtidal reef, and five (5) acres for intertidal oyster reef creation, resulting in a long-term, minimal impact. Approximately 85.4 acres could be excavated for temporary flotation channels resulting in a short-term impact. It is anticipated that finfish would move away to other readily available aquatic habitats during the construction period. Fish present in the area of the project component could be subject to a temporary increase in sound pressure levels, a temporary decrease in water quality, entrainment in dredge sediments, and removal of benthos from areas. Sound pressure level increases or entrainment could result in mortality of individual finfish. Overall, this would be a minor short-term adverse effect that would not be expected to reduce local fish populations or designated EFH.

There would be minor, long-term, adverse impacts to EFH for species that rely on soft bottom habitat as a result of the project. Minor, long-term, adverse impacts to EFH for various life stages of yellowtail snapper and white shrimp are listed in Table 6-10.

There would be short term, minor, impacts to EFH for species that utilize both soft and hard bottom habitat. Short-term, minor, impacts to EFH for various life stages of red drum, gray snapper, lane snapper, Spanish mackerel, and brown shrimp are listed in Table 6-10.

Table 6-11. Restoring Living Shorelines and Reefs in Mississippi Estuaries-Summary of Impacts to EFH

Project Activity	Acreage Impacted	Habitat	Nature of Impact
Breakwater	4.1 miles (17.9 acres)	Intertidal substrate off marsh edge; -3 to 6 ft. contour	Covering sediments with breakwater; establishment of a high relief living reef
Subtidal Reef Habitat	267 acres	0 -10 ft. MLLW; existing or historic hard bottom/reef habitat; unconsolidated bottom types including sand, muddy sand, and mud bottom	Cultch deployment of 267 acres of subtidal reef habitat
Intertidal Reef Habitat	5 acres	0 to 3 ft. MLLW; mud flats and soft bottom; existing or historic intertidal reef habitat	Cultch deployment of 5 acres of intertidal reef habitat
Temporary Flotation Channels	85.4 acres	Soft bottom substrate	Dredge and side cast a 44,635 ft. of channel 80 ft. wide and 6 ft. below MLLW
Total	375.3 acres		

SAV beds would be avoided to the extent practicable. Table 6-11 includes EFH for SAV-dependent species that would be affected by the project. Breakwaters, intertidal reefs and subtidal reefs are expected to develop into living reefs that support benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, and crabs and would protect salt marsh habitat. Table 6-10 includes EFH for various life stages of fishes which benefit from the utilization of hard bottom and marsh including, red drum, cubera snapper, gray snapper, goliath grouper, red grouper, brown shrimp, and white shrimp.

The Final Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review procedures would result in the avoidance and minimization of impacts to essential fish habitat. Essential Fish Habitat consultation with NMFS' Habitat Conservation Division (HCD) was completed (NOAA, 2015). The Trustee will work with NMFS to ensure appropriate conservation measures are used, which could include:

- Use of BMPs to minimize and avoid all potential adverse impacts to EFH during Restoring Living Shorelines and Reefs in Mississippi Estuaries construction and monitoring. This conservation measure recommends the use of BMPs during construction to reduce impacts from project implementation. BMPs shall include but are not limited to:

    a. Work barges would be moored for overnight and weekends/holidays in areas where previous impacts have occurred.
    b. After installation of the structures is completed, the flotation channels would be filled in mechanically.
    c. All construction activities would be completed during daylight hours.

- Pilings would be driven instead of jetting to reduce the disturbance of bottom sediments and bottom dwelling organisms..

- Monitoring would assess whether unexpected impacts to EFH have occurred. If immediate post-construction monitoring reveals that unavoidable impacts to EFH have occurred, appropriate coordination with regional EFH personnel would take place to determine appropriate response measures, possibly including mitigation. If additional adaptive management of the breakwater structure is necessary after monitoring events, all minimization measures discussed above would be followed.

6.2.7.2.2 Summary of Impacts to the Biological Environment

Impacts to the biological environment from implementation of the Restoring Living Shorelines and Reefs in Mississippi Estuaries would include:

- SAVs: No long-term adverse effects to SAVs are expected. Short-term, minor, adverse impacts to SAVs could occur in the vicinity of the project resulting from temporary sedimentation in beds. Any disturbance would temporary in nature; it is anticipated that SAV beds would recover naturally. Construction of the breakwaters in St. Louis Bay and Back Bay could provide or protect

areas conducive to SAV growth which could provide long term benefits as established or ephemeral SAV beds in these waterbodies.

- Invasive Species: No long-term adverse effects from invasive species are expected. Any adverse impacts from invasive species are expected to be short-term and minor. Mitigation measures and BMPs would reduce the likelihood of impacts from invasive species.
- Benthic Infauna and Epifauna: Potential short-term minor impacts to benthic organisms may occur from increased turbidity, substrate disturbance, or siltation during construction. Following construction, there is expected to be increased habitat utilization of the zone between the breakwater and the existing eroded shoreline, and long-term benefit due to the placement of hardened structure. This represents a substantial long-term benefit for these organisms.
- Marine Mammals: Short-term minor adverse effects due to noise and turbidity associated with placement of structures could temporarily disturb marine mammals species if they are in the vicinity of the project area. Based on the mobility of these species, the short duration of construction activities, the proposed construction methodology, and implementation of BMPs, effects on marine mammals are not anticipated.
- Protected Species: The Trustee is coordinating with the USFWS and NOAA-NMFS to determine affects to protected species. A summary of impacts to protected species and critical habitats is provided below:

Protected Species / Critical Habitat	Potential Impacts to Species/Critical Habitat
Five (5) Sea Turtles Species	Applicable to all project components. While not likely to be impacted, sea turtles are a mobile marine species and project activities would not impede transitory routes. There is no nesting habitat in the project area. There is no designated or proposed critical habitat for sea turtles within the action area. If individuals enter construction areas, construction would be halted and could result in short-term, minor impacts.
Alabama Red-Belly Turtle (*Pseudemys alabamensis*)	Applicable to all projects in Back Bay and Vicinity. This species is a concern in the Back Bay of Biloxi. Alabama red-belly turtle habitat includes fresh and brackish waters, river banks and uplands, and submerged and emergent aquatic vegetation Due to the brackish conditions and lack of SAVs for foraging at the project site it is unlikely that the species would be present in the project area and that impacts would occur.
Piping plover *(Charadrius melodus)* and red knot (*Calidris canutus rufa*)	Applicable to Grand Bay Intertidal and Subtidal Reefs. Piping plover are not known to use the action area, however; they could be present between August and May. In coastal Mississippi, the red knot is mainly a migratory species that uses coastal beaches and marine intertidal areas as stopover feeding locations or staging areas from March to April during the northward spring migration and September and October during the southward autumn migration (Niles et al. 2007; USFWS 2013). If an individual enters the project area and is disturbed, it is expected that they would be able to move to another nearby location (within their normal daily movement pattern) to continue foraging, feeding and resting. If individuals of either species are within 150 feet of the construction area, work will stop until the individual(s) leave of their own volition. The project will be implemented to ensure no effects to the PCEs of nearby piping plover are impacted.
West Indian manatee *(Trichechus manatus)*	Applicable to all project components. West Indian manatees are not likely to occur in the project area. Short-term minor impacts could occur if manatees come into contact with construction activities. Manatees are a mobile marine species and project activities would not impede transitory routes. If individuals are within 50 feet of construction areas, construction would be halted until the individual leaves the area of its own volition.

Protected Species / Critical Habitat	Potential Impacts to Species/Critical Habitat
Gulf sturgeon *(Acipenser oxyrhynchus desotoi)* (Designated Critical Habitat)	Applicable to Grand Bay Intertidal and Subtidal Reefs; and Deer Island Intertidal Reef. The project is in designated critical habitat. To the extent practicable, project construction at the Deer Island Subtidal Reef and the Grand Bay Intertidal and Subtidal Reef project components would be limited to the window between May and October, after sturgeon have migrated to their riverine habitat. If work continues beyond the May to October window, continued adherence to the Sea turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) would minimize the potential for impacting Gulf Sturgeon. No project components are located within riverine ecosystems. If individuals enter construction areas, short-term, minor impacts could be the result. PCEs for Gulf Sturgeon would not be adversely modified by the proposed project.
Mississippi diamondback terrapin (*Malaclemys terrapin pileata*)	Applicable to all project components. The proposed project could contain nesting habitat. In order to avoid impacting the diamondback terrapin and habitat, the Trustee would identify and also avoid pocket beaches to the maximum extent practicable in the design of the project. Since work would be conducted in shallow water marine environment, impacts to diamondback terrapin and habitat are not anticipated.

- Migratory Birds/Bald and Golden Eagles:
    - Due to the implementation of best management practices no "take" is anticipated for bald eagles. Golden eagles are not present in the area.
    - Potential adverse effects to birds include elevated noise levels due to the presence of construction equipment. These species are mobile and would likely exit the area during construction (no impacts to overall population). Therefore, impacts are expected to be short-term, localized, and minor.
- EFH:
    - It is anticipated that finfish would move away to other readily available aquatic habitats during the construction period. Fish present in the area of the project component could be subject to a temporary increase in sound pressure levels, a temporary decrease in water quality, entrainment in dredge sediments, and removal of benthos from areas. Sound pressure level increases or entrainment could result in mortality of individual finfish. Overall, this would be a minor short-term adverse effect that would not be expected to reduce local fish populations or designated EFH.
    - There would be minor, long-term, adverse impacts to EFH for species that rely on soft bottom habitat as a result of the project.
    - There would be short term, minor, impacts to EFH for species that utilize both soft and hard bottom habitat.
    - There would be a long term benefit to EFH by creation of reef habitat.

6.2.7.3 Human Uses and Socioeconomics

6.2.7.3.1 Cultural Resources

Affected Environment

Cultural resources include historic properties listed in, or eligible for listing in the National Register of Historic Places (36 C.F.R. §60[a-d]). The National Historic Preservation Act of 1966 (NHPA), as amended (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]." The definition of historic properties also includes significant traditional religious and cultural properties important to Indian tribes. Historic properties include built resources (bridges, buildings, piers, etc.), archaeological 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 include submerged resources.

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. The Trustee is currently conducting a literature review of the project component areas. Previously recorded archaeological sites, shipwrecks, historical standing structures, National Register of Historic Places (NRHP) properties, National Register Districts and National Historic Landmarks are being reviewed. The preliminary review of the previously recorded archaeological sites using MDAH records revealed archaeological sites located within the vicinity of the project component areas. The types of sites include shell middens and charted shipwrecks.

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.8 of the Final Phase III ERP/PEIS describe the impacts to cultural resouces from early restoration project types 2 (Protect Shorelines and Reduce Erosion) and type 6 (Restore Oysters). These project types would be analyzed for potential effects to cultural resources prior to being implemented and most adverse effects to cultural resources would be avoided or minimized. However, inadvertent impacts to unknown sites, buildings, structures, or objects could occur, resulting in minor to moderate short-term and long-term impacts. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts to cultural resources. No mitigation measures would be necessary.

Proposed Action

The NHPA charges the federal government with protecting the cultural heritage and resources of the nation. A complete review of this project under Section 106 of the NHPA is ongoing and will be completed prior to any project activities that will restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project will be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

6.2.7.3.2 Land and Marine Management

Affected Resources

Governing the nature of land use development of the project component areas is the 1972 Coastal Zone Management Act (CZMA), which provides for management of the nation's coastal resources and balances economic development with environmental conservation. The overall program objectives of CZMA remain balanced to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." The water bottoms are considered state-owned and part of the Public Trust Tidelands.

The National Estuarine Research Reserve and Coastal Preserves in the Project Areas

The Grand Bay National Estuarine Research Reserve, Graveline Bay Preserve, Deer Island Preserve, Wolf River Preserve, and Jourdan River Preserve are managed resources in the vicinity of the proposed project. A summary of planned land and marine management of the preserves is provided here.

Grand Bay (Jackson County): Grand Bay National Estuarine Research Reserve (GBNERR) includes over 18,000 acres of coastal wetlands and estuarine marsh that was designated into the National Estuarine Research Reserve System in 1999 as authorized under the provisions of the Coastal Zone Management Act of 1972. The Mississippi Department of Marine Resources manages GBNERR in conjunction with NOAA. The Grand Bay NERR is located within the larger 26,900 acre Grand Bay Savanna Preserve, which is a part of the Mississippi Coastal Preserve program. Lands within Grand Bay NERR/Grand Bay Savanna Preserve are either privately, locally, state or federally owned.

The Grand Bay National Estuarine Research Reserve Management Plan 2013-2018 (GBNERR 2013) outlines management efforts. Founded on the principle that long-term protection of representative estuaries form stable platforms for research and education, the GBNERR and all reserves in the system employ a place-based approach for the application of management practices and demonstration sites where new ideas are tested. The mission of the GBNERR is to practice and promote informed stewardship of coastal resources through innovative research, education and training. Staff and partners will work collaboratively to address focus areas relating to habitat protection, climate change and water quality. The management plan outlines four goals, including 1) enhancing the GBNERR's goal as a distinguished center for estuarine research, 2) using scientific understanding to inform management of

coastal resources, 3) connecting with local communities on value of coastal ecosystems, and 4) improving science-based decision making.

Strategies and actions to enhance protection of Reserve resources are outlined and aligned with Grand Bay objective 2-5:

"Developing partnerships to implement comprehensive management of resources, addressing acquisition, restoration and enhancement, resource protection, public access and resource manipulation".

Restoration activities require planning and review by MDMR and NOAA through the Reserve management plan. Restoration planning may require historical research to determine the "natural" representative state of an estuarine area. Current monitoring efforts at Grand Bay NERR include marsh birds, fish, water quality, and climate change indicators (surface elevation tables).

Graveline Bay Preserve (Jackson County): The Graveline Bay Preserve is designated as a coastal preserve in the Mississippi Coastal Preserves Program. It contains 2,339-acres and is bounded by Graveline Bay and Bayou. MDMR manages the area as a coastal preserve for conservation purposes to protect ecological integrity of tidal marsh (MDMR 2015a). The Graveline Bay project components include intertidal and subtidal reef restoration.

Deer Island Preserve (Harrison County): The Deer Island Preserve is designated as a coastal preserve in the Mississippi Coastal Preserves Program. It consists of 674 acres bounded by the beach along the island. MDMR manages the area as a coastal preserve. Much of the property considered tidal wetlands, already owned by the State (MDMR 2015b). The Deer Island project component, which would occur in the waters of the Mississippi Sound adjacent to the north of Deer Island preserve, includes subtidal reef restoration.

Wolf River Preserve (Harrison County): The Wolf River Preserve is designated as a coastal preserve in the Mississippi Coastal Preserves Program. The 2,426-acre preserve contains non-forested marsh along the Wolf River. MDMR cooperates with intergovernmental and private entities to manage the area as a coastal preserve for conservation purposes to manage the unique ecosystem surrounding the Wolf River Marsh (MDMR 2015c). The Wolf River Living Shoreline and Subtidal Reef component is partially located within the boundaries of the Wolf River Preserve.

Jourdan River Preserve (Hancock and Harrison County): The 6,423-acre Jourdan River Preserve is designated as a coastal preserve in the Mississippi Coastal Preserves Program. Its primary boundary is from the mouth of the Jourdan River (open saline marsh) to where the area becomes forested. MDMR manages the area as a coastal preserve. Much of the property considered tidal wetlands, already owned by the State (MDMR 2015d). The St. Louis Bay Living Shoreline component is almost entirely located within the boundaries of the Jourdan River Preserve.

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.10 of the Phase III ERP PEIS describe the impacts to land and marine management from early restoration project types 2 (Protect Shorelines and Reduce Erosion) and 6 (Restore Oysters). These project types are expected to result in short-term minor to moderate adverse impacts, primarily from the interruption of operations. Long-term benefits to land and marine management are also expected as restoration activities would help align management goals and assist management and staff to best manage properties for the benefit of the environmental and human environment. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP PEIS.

No Action

Under the No Action alternative, there would be no impacts to land and marine management. No mitigation measures would be necessary. There would be no benefits to land and marine management from the creation of intertidal and subtidal reefs habitat.

Proposed Action

The Grand Bay NERR/Grand Bay Savanna Preserve, Graveline Bay Preserve, Wolf River Preserve, Deer Island Preserve, and Jourdan River Preserve are managed resources in the vicinity of the Project.

Grand Bay NERR/Grand Bay Savanna Preserve: There are intertidal and subtidal components in the Grand Bay project area that would occur on the Grand Bay NERR/Grand Bay Savanna Preserve. For the Grand Bay project area, the Trustee will coordinate closely with Grand Bay NERR staff and NOAA to ensure intertidal and subtidal reef restoration is consistent with the Grand Bay NERR Management Plan (GBNERR 2013). Projects would be sited to avoid all ongoing monitoring stations and with consideration of available baseline data. Natural cultch materials (i.e. oyster shells) would be used for intertidal and subtidal cultch placements.

Coastal Preserves: Wolf River Preserve, Deer Island Preserve, and Jourdan River Preserve are in the Mississippi Coastal Preserve Program. For projects within the Coastal Preserve boundary, the Trustee will coordinate with Coastal Preserve staff to ensure that activities do not interfere with and are consistent with current management practices, ecological targets, and site specific management plans .. There could be short-term minor impacts due to deployment of breakwaters, subtidal reefs, intertidal reefs and temporary flotation channels. For breakwaters, intertidal reefs and subtidal reef sited within Coastal Preserve administrative boundaries, materials specially designed to promote oyster accretion will be given preference. Over time, the breakwaters, intertidal and subtidal restoration areas would develop into living reefs that support benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, and crabs. Breakwater would reduce shoreline erosion as well as marsh loss. There would be long term ecological benefits that would be consistent with planned land and marine management. The project would not disrupt existing or planned land management or monitoring activities.

The Phase III ERP/PEIS provides mitigation measures in Appendix 6A. The following mitigation measures and environmental review procedures would result in the avoidance and minimization of impacts to land and marine management:

- Because the proposed project has reasonably foreseeable effects on coastal uses or resources that are the subject of federally approved Coastal Zone Management Plans in Mississippi, the Federal Trustees submitted a consistency determination for the project to the Mississippi Department of Marine Resources (MDMR). MDMR concurred with that determination on behalf of its state. As noted in that response. additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation.
- The Trustee would coordinate with Grand Bay NERR Staff and NOAA to ensure project consistency with the Grand Bay NERR Management Plan (GBNERR 2013).
- Siting of breakwaters, intertidal reefs, subtidal reefs and temporary flotation channels would avoid monitoring sites.
- Construction would be completed so as not to interfere with management or monitoring activities at Grand Bay NERR. There would be no breakwaters or temporary flotation channels constructed in the Grand Bay NERR.
- Temporary flotation channel dimensions (e.g., length, depth and width) would be minimized and to the extent practicable, avoided depending on project design and/or construction timing.
- In areas where temporary flotation channels are required, work barges would be moored for overnight and weekends/holidays only in areas where previous impacts have occurred (temporary flotation channels, deployment areas).
- Spoil from temporary flotation channels would be placed on the side of the channel. After installation of the structures is completed, the temporary flotation channels would be filled in mechanically.
- Natural cultch materials (i.e. oyster shells), or material approved by the Grand Bay NERR staff, would be used for intertidal and subtidal cultch placements in the Grand Bay NERR.
- Restoration planning may require historical research to determine the “natural” representative state of an estuarine area

6.2.7.3.3 Aesthetics and Visual Resources

Affected Environment

The affected environment consists of the footprint of the project components, current open water areas seaward of the breakwater structures, as well as areas visible from the footprint. There are no designated protected viewsheds or historic resources in the vicinity of the project components.

Grand Bay, Graveline Bay, and St. Louis Bay Project Components (Jackson, Harrison, and Hancock Counties): The landscape in the vicinity of the proposed project area is characterized by a mosaic of marsh wetlands with patches of mature coastal forest, which have the effect of providing visual barriers around existing communities. Unobstructed views of open water exist generally only from the shoreline. Visual receptors include boaters in the Mississippi Sound, Grand Bay, Graveline Bay, and St. Louis Bay.

Back Bay of Biloxi and Vicinity Project Components (Jackson and Harrison Counties): Back Bay of Biloxi is surrounded by a mix of industrial, commercial and residential properties. Navigation channels are in use throughout the entire bay, and have high traffic volume.

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.14 of the Final Phase III ERP/PEIS describe the impacts to aesthetic and visual resources from early restoration project types 2 (Protect Shorelines and Reduce Erosion) and 6 (Restore Oysters). These project types are expected to result in short-term minor to moderate adverse impacts as a result of the presence of readily apparent construction equipment and personnel as well as barriers and construction-related dust and emissions, which would contrast with and detract from the natural viewshed. In the event that construction related actions involve dredging activities into scenic viewsheds, adverse impacts could be elevated to major, and would remain short-term. In the event that these construction-related projects result in the long-term placement of structures or signage, long-term, minor adverse impacts would occur, with the magnitude of their impact decreasing over time as these objects become more commonplace in the area. Long-term benefits to aesthetics and visual resources are also expected as a result of improved habitat areas that reflect a more natural setting. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts to aesthetics and visual resources. No mitigation measures would be necessary. There would be no long-term benefits to aesthetics or visual resources resulting from improved habitat areas.

Proposed Action

During construction, there would be short-term, minor adverse aesthetic and visual impacts for recreational boaters and fishermen due to construction equipment in and around the project area. Residents, people who use the bays for recreation, and businesses along the shoreline would experience minor adverse aesthetic and visual impacts during construction. After construction is completed, the breakwater and/or the reefs may be exposed at MLW. The outer surface of these reefs consists of natural material such as bagged shells or artificial material such as riprap. Both of these materials are present in the existing environment. The deployed materials would blend well with the surrounding substrate, which would not adversely affect aesthetic and visual resources.

In addition, navigation signs in the project area would alert boaters to the presence of the breakwater (including gaps in the breakwater) and reefs. Because this is an area already used by recreational and commercial boaters, the addition of navigation signs would be consistent with other navigational

signage/aids already present in the project vicinity. There would be no long-term impact from sign placement.

6.2.7.3.4 Public Health and Safety and Shoreline Protection

Affected Resources

Shoreline erosion is apparent at all of the project components that include construction of a breakwater. Erosion rates were calculated using 2014 aerials and 1850 or 1950 historical shoreline data (MDEQ 2015) and aerial imagery (Google Earth Pro 2015 and 2015a). Erosion rates range from 0.50 to 4.50 feet per year. No hazardous materials currently exist at the project area and there is no potential for human exposure to natural or man-made hazards.

Environmental Consequences

Programmatic Review

Sections 6.3.2, 6.3.6, and 6.7.15 of the Final Phase III ERP/PEIS describe the impacts to public health and safety, including flood and shoreline protection from early restoration project types 2 (Protect Shorelines and Reduce Erosion)and 6 (Restore Oysters). These project types are expected to result in short-term construction-related adverse impacts, primarily as a result of the operation of heavy equipment and construction materials. In the event that hazardous materials are used and unintentionally released into the environment or the use of barges or boats contaminates surface waters, there could be minor, short-term adverse effects. Long-term beneficial impacts from restoration and rehabilitation projects could reduce the risk of potential future hazards or reduce currently present water contamination. Direct and indirect effects of these project types would largely result in long-term beneficial impacts. The impacts anticipated from the proposed action discussed below are consistent with the range of impacts described in the Final Phase III ERP/PEIS.

No Action

Under the No Action alternative, there would be no impacts to public health and safety and shoreline protection. No mitigation measures would be necessary. There would be no shoreline protection benefits resulting from the construction of breakwaters.

Proposed Action

There could be minor short-term impacts resulting from the operation of heavy equipment or from the incidental releases of surface water contaminates from barge and boats. The proposed breakwater structures would have long-term benefits by helping to protect the shoreline from wave erosion. All hazardous materials handled during construction activities (fuel, lubricants, etc.) would be contained and appropriate barriers would be placed to protect the adjacent coastal resources.

The Final Phase III ERP/PEIS provides mitigation measures in Appendix 6A.The following mitigation measures would be used to avoid and minimize impacts to public health and safety and shoreline protection:

- Best management practices in accordance with Occupational Safety and Health Administration (OSHA) and state and local requirements would be incorporated into construction activities onsite to ensure the proper handling, storage, transport, and disposal of all hazardous materials.
- Personal protective equipment would be required for all construction personnel, and authorized access zones would be established at the perimeter of the project site. As a result, adverse impacts to public health and safety would not be expected.

6.2.7.3.5 Summary of Impacts to the Human Uses and Socioeconomics

Impacts to the human uses and socioeconomics from implementation of the Restoring Living Shorelines and Reefs in Mississippi Estuaries would include:

- Cultural Resources: A complete review of this project under Section 106 of the NHPA would be completed as environmental assessment continues. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.
- Land and Marine Management: Implementation of the project would be consistent with planned land and marine management and would not disrupt existing or planned land uses. There could be short-term minor impacts due to deployment of subtidal and intertidal reefs. There would be long term ecological benefits that would be consistent with planned land and marine management.
- Aesthetics and Visual Resources: During construction, there would be short-term, minor adverse aesthetic and visual impacts for recreational boaters and fishermen due to construction equipment in and around the project area. Residents, people who use the bays and estuaries for recreation, and businesses along the shoreline would may experience minor adverse aesthetic and visual impacts during construction. The deployed materials would not adversely affect aesthetic and visual resources.
- Public Health and Safety and Shoreline Protection: There could be minor short-term impacts resulting from the operation of heavy equipment or from the incidental releases of surface water contaminates from barge and boats. The proposed breakwater structures would have long-term benefits by helping to protect the shoreline from wave erosion.

6.2.8 Cumulative Impacts

As discussed in Chapter 4, the CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined as “the impact on the 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” (40 C.F.R. §1508.7).

This cumulative impacts analysis tiers from the Final Phase III ERP/PEIS analysis of programmatic Alternative 4 (Contribute to Restoring Habitats, Living Coastal and Marine Resources, and Recreational

Opportunities), which evaluated the type of restoration activity proposed for the Restoring Living Shorelines and Reefs in Mississippi Estuaries The Final Phase III ERP/PEIS analysis of cumulative impacts relevant to the proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries project is incorporated by reference into the following cumulative impacts analysis for this Phase IV project. The following analysis focuses on the potential additive effects of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project to the effects of past actions evaluated in the Final Phase III ERP/PEIS cumulative impacts analysis and the effects of some past, present, and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS.

6.2.8.1 Site Specific Review and Analysis of Cumulative Impacts to Relevant Resources

This section describes past, present, and reasonably foreseeable future actions that were not discussed in the Final Phase III ERP/PEIS, but which are relevant to identifying any cumulative impacts the proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries Project may have on a local scale. Context and intensity, defined in Section 6.2.4, are used to determine whether a potential cumulative impact from the Restoring Living Shorelines and Reefs in Mississippi Estuaries t exists. The relevant affected resources analyzed in this EA are:

6.2.8.1.1 Geology and Substrates

- Hydrology and Water Quality including Water Resources
- Living Coastal and Marine Resources and Habitats
- Protected Species including MBTA Compliance
- Cultural Resources
- Land and Marine Management
- Aesthetics and Visual Resources
- Public Health and Safety and Shoreline Protection

Those resources described in Section 6.2.7 were considered but not carried forward for further analysis would not have impacts and therefore, would not have cumulative impacts. Air quality and greenhouse gas emissions; noise; socioeconomics and environmental justice; infrastructure and; tourism and recreation are resource areas considered but not carried forward in the Restoring Living Shorelines and Reefs in Mississippi Estuaries EA.

Local and site-specific past, present, and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS were identified through conversations with state and federal resource agency staff and searching websites for projects relevant to the Restoring Living Shorelines and Reefs in Mississippi Estuaries. The local action area is defined as the four (4) project component locations and immediate surroundings in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay. Actions that would be relevant to the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project cumulative impacts analysis are defined here as those with similar scope, timing, impacts, or location. For restoration related to the Spill (Early Restoration Phases I, II & III, Restore Act, Gulf Environmental Benefit Fund) and for North American Wetlands Conservation Fund projects two websites were searched:

- http://www.nfwf.org/whoweare/mediacenter/pr/Pages/gulf-main-pr-14-1117.aspx
- http://eli-ocean.org/gulf/restoration-projects-database/
- https://restoration.atlas.noaa.gov/src/html/index.html

Past, present, and reasonably foreseeable actions not identified in the Final Phase III ERP/PEIS are summarized in Table 6-12.

Table 6-12. Description of past, present, and reasonably foreseeable future actions not identified in the PEIS

Category/Projects	Project Description	Key Resource Areas with Potential for Cumulative Impacts*
Restoration Related to the Spill (Early Restoration Phases I, II & III, Restore Act, Gulf Environmental Benefit Fund, North American Wetlands Conservation Fund, National Academy of Sciences)		
Bayou Caddy Ecosystem Restoration (Shoreline Stabilization)	The Mississippi Comprehensive Coastal Improvements Program (MsCIP) Bayou Caddy Ecosystem Restoration Site is a constructed restoration/dredged material beneficial use site in Hancock County, Mississippi. The proposed Shoreline Stabilization Project involves the construction of an offshore breakwater and living shoreline located at the Restoration Site, intended to reduce wave energy, protect the site from further storm damage, extend the life of the newly re-constructed geotubes, provide protection to the established wetland, and enhance habitat for oysters, fish and other marine organisms. The project is in the permitting phase.	Short to long-term impacts to: • geology and substrates • hydrology and water quality • living coastal and marine resources • habitat Long-term benefits to: • habitat • land and marine management
Invasive Species Management on Coastal State Land	National Fish and Wildlife Foundation (NFWF) Gulf Environmental Benefit Fund (GEBF) Project to address invasive species management on land within Mississippi's Coastal Preserves Program and on two state parks (Buccaneer and Shepard) and Ward Bayou Wildlife Management Area. Work will include prescribed burning, mechanical and chemical control of invasive vegetation, and feral hog control. Round 2 project funded but not yet started.	Short to long-term impacts to: • living coastal and marine resources • habitat • land and marine management Long-term benefits to: • living coastal and marine resources • habitat • land and marine management
Submerged aquatic vegetation Pilot Project	U.S. Army Corps of Engineers (USACE) MsCIP Phase I (Water Resources Development Act) proposed submerged aquatic vegetation restoration Grand Bay NERR .	Long-term benefits to: • living coastal and marine resources • habitat
Deer Island Restoration Project	1,600 linear feet of Intertidal living shoreline bagged oyster shell and coir logs, north side of Deer Island. 7 acres tidal wetland habitat protected. Completed in 2013, maintenance ongoing until 2017.	Short to long-term impacts to: • geology and substrates • hydrology and water resources • living coastal and marine resources • habitat Long-term benefits to: • living coastal and marine resources • habitat
Deer Island Tidal Marsh Restoration Project (Beneficial	• Restoration of 40 acres of tidal marsh habitat and 5 acres of beach habitat. Project is ongoing; the site is designed to	Short to long-term impacts to: • geology and substrates • hydrology and water resources

Category/Projects	Project Description	Key Resource Areas with Potential for Cumulative Impacts*
Use [BU] Projects)	accept suitable dredge material for several more years before reaching target elevation. • A 98-acre lagoon between the south beach and the island was created during the MsCIP Deer Island Project. Lagoon will be used by the USACE as a BU site for Biloxi Channel maintenance dredging. When completed the site will result in the restoration of 98 acres of tidal marsh habitat. Project is ongoing.	• living coastal and marine resources • habitat Long-term benefits to: • living coastal marine resources • habitat
Deer Island Oyster Reef Restoration Project	MDMR Deer Island Oyster Reef Restoration project revitalized a 17-acre area of oyster reef north of Deer Island was completed 2014.	Short to long-term impacts to: • geology and substrates Long-term benefits to: • living coastal and marine resources • habitat
Bayou Cumbest Restoration	MsCIP Project: Adjacent to Grand Bay Coastal Preserve-restoration of 110 acres of tidal wetlands and management of 38 acres of scrub/shrub wetlands. Includes filling ditches, removal of exotic species, and planting of Native vegetation.	Short to long-term impacts to: • Geology and substrates • hydrology and water resources • living coastal and marine resources • habitat • land and marine management Long-term benefits to: • living coastal and marine resources • habitat • land and marine management
Utilization of Dredge Material for Marsh Restoration in Coastal Mississippi	NNFWF GEBF Project to utilize dredge material in the sustainable restoration and creation of marsh habitat within St. Louis Bay, Back Bay of Biloxi, and Escatawpa is critical to enhancing ecosystem functioning and integrity of priority bays and estuaries of the Mississippi Gulf Coast. Approved Round 2 Project, pending.	Short to long-term impacts to: • geology and substrates • hydrology and water resources • air quality • living coastal and marine resources • habitat Long-term benefits to: • living coastal and marine resources • habitat
LaFrancis Camp Trenaisse	MsCIP project: Feasibility Study is underway to restore 45 acres of open water to marsh by backfilling a pipeline canal; also includes invasive species control in the Hancock County Marsh.	Short to long-term impacts to: • geology and substrates • hydrology and water resources • living coastal and marine resources • habitat Long-term benefits to: • living coastal and marine resources • habitat • land and marine management

Category/Projects	Project Description	Key Resource Areas with Potential for Cumulative Impacts*
Greenwood Island BU Site	28-acre BU site, designed by USACE, built by Port of Pascagoula, now under management by MDMR. Rock containment and sand dike complete. Current project near Pascagoula. Needs another 100-150,000 yards of material. Project is ongoing.	Short to long-term impacts to: • geology and substrates • hydrology and water resources • living coastal and marine resources • habitat Long-term benefits to: • living coastal and marine resources • habitat
Round Island BU Site	Restoration of a relict shoal to the northwest of Round Island, construction of containment structure capable of containing 70 acres was completed in 2014. Site is available to receive BU material and is permitted for 220 acres (ultimate capacity of 2.5 Million cubic yards. Project is ongoing.	Short to long-term impacts to: • geology and substrates • hydrology and water resources • living coastal and marine resources • habitat Long-term benefits to: • living coastal and marine resources • habitat
Tourism and Recreation		
Deer Island Pier Project	Mississippi Secretary of State project to construct a-260-foot access pier on the north side of Deer Island, to provide public access to Deer Island for enhanced recreational and educational use by the general public. Proposed project, currently in the permitting phase.	Short-term impacts to: • geology and substrates • hydrology and water resources • living coastal and marine resources • habitat

6.2.8.1.2 Review and Analysis of Cumulative Impacts to Relevant Natural Resources

This section presents a brief summary of the Final Phase III ERP/PEIS cumulative impact findings for each resource potentially affected by the Restoring Living Shorelines and Reefs in Mississippi. It then considers whether the cumulative actions identified above affect these findings. For the Restoring Living Shorelines and Reefs in Mississippi Project, specifically, the affected resources analyzed in this section include:

- Geology and Substrates
- Hydrology and Water Quality (including wetlands)
- Living Coastal and Marine Resources (including habitats and protected species)
- Land and Marine Management

6.2.8.1.3 Geology and Substrates

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.1 Geology and Substrates, Table 6-4. As described above, the Restoring Mississippi Living Shorelines and Reef in Mississippi Estuaries would have a minor, long-term, adverse impacts on geology and substrates and would also have provide long-term beneficial impacts to shorelines.

The Final Phase III ERP/PEIS found that when Alternative 2 was analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 2 would not contribute substantially to short-term or long-term cumulative adverse impacts to geology and substrates. However, Alternative 2 carried out in conjunction with other environmental stewardship and restoration efforts has the potential to result in long-term beneficial cumulative impacts to geology and substrates in the Gulf Coast region because of the potential for synergistic effects of Alternative 2 project types with these other environmental stewardship and restoration activities. In this manner, the Restoring Living Shorelines and Reefs in Mississippi Estuaries is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

Ten projects are identified as potential contributors to cumulative impacts (adverse and beneficial) on geology and substrates when their impacts are combined with those of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Phase IV Project; Bayou Caddy Ecosystem Restoration (Shoreline Stabilization), Deer Island Restoration Project, Deer Island Tidal Marsh Restoration Project (Beneficial Use-(BU) Projects), Deer Island Oyster Reef Restoration Project, Bayou Cumbest, Utilization of Dredge Material for Marsh Restoration in Coastal Mississippi, LaFrancis Camp Trenaisse, Greenwood Island BU Site, Round Island BU Site, and Deer Island Pier Project; Table 6-13). Shoreline protection, marsh restoration with BU material and reef restoration project elements would create a short-term adverse impact as well as a long-term beneficial impact. The Deer Island pier project would include the construction of hard structures over soils and sediment.

When the Phase IV Restoring Living Shorelines and Reefs in Mississippi Estuaries is analyzed in combination with other past present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to geology and substrates would likely occur. The Phase IV restoration project would not contribute substantially to cumulative adverse impacts. The Phase IV Early Restoration project, carried out in conjunction with other restoration efforts would also have the potential to result in some long-term beneficial cumulative impacts to geology and substrates.

6.2.8.2 Hydrology and Water Quality

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.2 Hydrology and Water Quality, Table 6-5. As described above, the Restoring Mississippi Living Shorelines and Reef in Mississippi Estuaries would have a minor, short-term, adverse impacts water quality resulting from increased turbidity during construction. Breakwaters, once established as living reefs could benefit local water clarity because bi-valves such as oysters and mussels feed by filtering the water column. The reef could also reduce wave energy reaching the shoreline, minimizing erosion, and decreasing sediment suspended in the water column from erosion. The project types could result in long-term minor improvements to water quality because they would extend beyond the construction period.

The Final Phase III ERP/PEIS found that when Alternative 2 was analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 2 would not contribute substantially to short-term or long-term cumulative adverse impacts to water quality and hydrology. However, Alternative 2 carried out in conjunction with other environmental stewardship and restoration efforts

may result in long-term beneficial cumulative impacts to hydrology and water quality in the Gulf Coast region because of the potential for synergistic effects of Alternative 2 project types with these other environmental stewardship and restoration activities. In this manner, the Restoring Living Shorelines and Reefs in Mississippi Estuaries is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

Nine projects are identified as potential contributors to cumulative impacts (adverse and beneficial) on hydrology and water quality when their impacts are combined with those of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Phase IV Project; Bayou Caddy Ecosystem Restoration (Shoreline Stabilization), Deer Island Restoration Project, Deer Island Tidal Marsh Restoration Project (BU Projects), Bayou Cumbest, Utilization of Dredge Material for Marsh Restoration in Coastal Mississippi, LaFrancis Camp Trenaisse, Greenwood Island BU Site, Round Island BU Site, and Deer Island Pier Project). Shoreline protection, marsh restoration with BU material and reef restoration project elements would create a short-term adverse water quality impacts from turbidity associated with construction but would also provide a long-term beneficial impact by reducing wave energies, resulting in shoreline/marsh protection.

When the Phase IV Restoring Living Shorelines and Reefs in Mississippi Estuaries is analyzed in combination with other past present, and reasonably foreseeable future actions, short-term cumulative adverse impacts to hydrology and water quality would likely occur. The Phase IV restoration project would not contribute substantially to cumulative adverse impacts. The Phase IV Early Restoration project, carried out in conjunction with other restoration efforts would also have the potential to result in some long-term beneficial cumulative impacts to hydrology and water quality.

6.2.8.2.1 Living Coastal and Marine Resources (Including Habitats and Protected Species)

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.2.1 Habitats (Table 6-8) and Section 6.8.4.2.2 Living Coastal and Marine Resources (Table 6-9). As described above, the Restoring Mississippi Living Shorelines and Reef in Mississippi Estuaries would have minor, short-term, adverse impacts on habitats and living and coastal marine resources (e.g. oysters, SAVs) resulting from increased turbidity during construction and unavoidable impacts from subtidal reef and breakwater construction. This Phase IV Project would also provide long-term beneficial impacts as intertidal reef deployments, subtidal reef deployments and breakwaters develop into living reefs. Breakwater placement would also enhance existing marsh habitat and could create SAV habitat. Protected species would be avoided and would potentially benefit from increases in marsh, SAVs and living reefs created by the project.

The Final Phase III ERP/PEIS found that when Alternative 2 was analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 2 would not contribute substantially to short-term or long-term cumulative adverse impacts to habitats or to living coastal and marine resources. However, Alternative 2 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to habitats and to living coastal and marine resources in the Gulf Coast region because of the potential for synergistic effects of Alternative 2 project types with these other environmental stewardship and restoration activities.

Twelve projects are identified as potential contributors to cumulative impacts (adverse and beneficial) on habitats and living coastal and marine resources when their impacts are combined with those of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Phase IV Project; Bayou Caddy Ecosystem Restoration (Shoreline Stabilization), Invasive Species Management on Coastal State Land, Submerged aquatic vegetation Pilot Project, Deer Island Restoration Project, Deer Island Tidal Marsh Restoration Project (BU Projects), Deer Island Oyster Restoration Project, Bayou Cumbest, Utilization of Dredge Material for Marsh Restoration in Coastal Mississippi, LaFrancis Camp Trenaisse, Greenwood Island BU Site, Round Island BU Site, and Deer Island Pier Project). Shoreline protection, marsh restoration with beneficial use material and reef restoration project elements would create short-term adverse impacts to habitats and living marine and coastal resources from localized water quality impacts, turbidity, noise, and general intrusion associated with construction activities but could provide a long-term beneficial impact by reducing wave energies, protecting shorelines/marsh, and creating oyster reefs. The Deer Island Peer project could have short-term minor impacts to soft bottom habitat and benthic communities.

When the Phase IV Restoring Living Shorelines and Reefs in Mississippi Estuaries is analyzed in combination with other past present, and reasonably foreseeable future actions, short -term cumulative adverse impacts to habitat and to living marine and coastal resources would likely occur. The Phase IV restoration project would not contribute substantially to cumulative adverse impacts. The Phase IV Early Restoration project, carried out in conjunction with other restoration efforts would also have the potential to result in some long-term beneficial cumulative impacts to habitats and to living marine and coastal resources.

6.2.8.2.2 Land and Marine Management

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.4 Land and Marine Management (Table 6-13). As described above, the Restoring Mississippi Living Shorelines and Reef in Mississippi Estuaries would have be consistent with planned land and marine management and would not disrupt existing or planned land uses. There could be short-term minor impacts due to deployment of breakwaters and subtidal and intertidal reef habitat. There would be long-term ecological benefits that would be consistent with planned land and marine management. This Phase IV Project would also result in long-term ecological benefits that would be consistent with planned land and marine management creation of subtidal and intertidal reef habitat.

The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 2 would not contribute substantially to short-term or long-term cumulative adverse impacts to land and marine management. Alternative 2 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to land and marine management in the Gulf Coast region because of the potential for synergistic effects of Alternative 2 project types with these other environmental stewardship and restoration activities from the alignment of management goals and assistance provided to management and staff to best manage properties from restoration, conservation and recovery efforts.

Four projects are identified as potential contributors to cumulative impacts (adverse and beneficial) on land and marine management when their impacts are combined with those of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Phase IV; Bayou Caddy Ecosystem Restoration (Shoreline Stabilization), Invasive Species Management on Coastal State Land, Bayou Cumbest, and LaFrancis Camp Trenaisse). Shoreline stabilization, marsh restoration and invasive species control measures would be consistent with planned land and marine management on and near state-managed Coastal Preserves and would not disrupt existing or planned land uses. There could be short-term minor impacts during the implementation of various restoration and management measures. There would be long-term ecological benefits that would be consistent with planned land and marine management.

When the Phase IV Restoring Living Shorelines and Reefs in Mississippi Estuaries is analyzed in combination with other past present, and reasonably foreseeable future actions, short-term cumulative adverse impacts to land and marine management would likely occur. The Phase IV restoration project would not contribute substantially to cumulative adverse impacts. The Phase IV Early Restoration project, carried out in conjunction with other restoration efforts would also have the potential to result in some long-term beneficial cumulative impacts to land and marine management.

6.2.8.2.3 Potential Cumulative Impacts When Evaluated with Other Phase IV Proposed Projects

The Restoring Living Shorelines and Reefs in Mississippi Estuaries would occur across the Mississippi Gulf Coast, in four bays at eight sites. Due to the small scale, minor, local and temporary impacts from the project components, the Phase IV project is not anticipated to contribute to potential adverse cumulative impacts in combination with other Phase IV projects. In terms of location, the closest Phase IV proposed projects to the Restoring Living Shorelines and Reefs in Mississippi Estuaries are the Point Aux Pins Living Shoreline and the Shell Belt-Coden Belt Road Living Shorelines. The projects consist of the construction activities to the southeast of Potersville Bay and between Bayou la Batre and Bayou Coden in the Mississippi Sound, Alabama. Restoration measures would include placement of nearshore intertidal breakwaters that may utilize artificial Wave Attenuation Units (WAUs) and would generally follow a +0.5 to +1.0 ft. Mean Lower Low Water (MLLW) target crest elevation. Cumulatively, these three projects would produce minor, short-term adverse environmental impacts from disturbance to natural and human resources (water quality, geology and substrates, coastal and marine resources, noise, tourism and recreation, and visual and aesthetics). All three of these efforts would contribute to beneficial impacts through the reduction in shoreline erosion, protection of water resources from breakwaters, and habitat enhancement.

The Phase IV St. Louis Bay Living Shoreline and Wolf River Living Shoreline and Subtidal Reef project components are also in proximity to the Phase III Hancock County Marsh Living Shoreline Project. That project would employ living shoreline techniques that utilize natural and/or artificial breakwater material to stabilize shorelines along an area in the eastern and western portions of the marsh. The Phase III Hancock County Marsh Living Shoreline project will also create 46 acres of marsh and 46 acres of subtidal habitat in Hancock County. Cumulatively, these two projects would not produce adverse environmental impacts in the short-term as construction activities would not be expected to occur at

the same time. Both projects would contribute to beneficial impacts through the reduction in shoreline erosion, protection of water resources from breakwaters, and habitat enhancement.

The Restoring Living Shorelines and Reefs in Mississippi Estuaries would not contribute adverse cumulative impacts when added to past, present or reasonably forseeable future actions.

6.2.9 Summary and Next Steps

The proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries would include shoreline and marsh protection, and reef creation resulting in increased benthic secondary productivity. It would use breakwater material to prevent shoreline erosion, create 267 acres subtidal reef habitat, and create five acres of intertidal reef habitat. The project is consistent with Alternative 4 (Contribute to Restoring Habitats and Living Coastal and Marine Resources, and Recreational Opportunities) of the Final Phase III ERP/PEIS.

NEPA analysis of the environmental consequences suggests that there would be long-term minor to moderate impacts to geology and substrates, and there would be minor short-term adverse impacts to other project specific resource categories. The project would provide long-term benefits by creating approximately 267 acres subtidal reef habitat, five acres of intertidal reef habitat, and approximately four miles (17.9 acres) of breakwater that will become high profile reef habitat. The Trustees have initiated coordination and consultation under the ESA, the MBTA , the MMPA, and the BGEPA. The Trustees have initiated consultation under the National Historic Preservation Act and other federal statutes. A summary of the results from each coordination and consultation process is provided below:

- Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA): NOAA reviewed the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project for compliance with the MSFCMA. It was determined that some activities have the potential for temporary short and long term minor site-specific adverse impacts to water bottom and water column characterized as Essential Fish Habitat, however, NMFS concurred that the best management practices (BMPs) proposed for implementation would be sufficient to avoid, minimize or offset impacts and no additional conservation recommendations were required (NOAA 2015).
- Endangered Species Act (ESA), MBTA, BGEPA, and Marine Mammal Protection Act (MMPA): To fulfill requirements and obligations under ESA and MMPA, NOAA and DOI are undergoing a review of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project for compliance with Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.) and Section 101 of the Marine Mammal Protection Act of 1972, as amended (16 U.S.C. 1371(a)(5) et seq.). Biological Evaluation forms have been submitted to the USFWS for consultation and coordination on the ESA, MBTA and BGEPA (DOI 2015) and to NMFS for ESA (NOAA 2015). The Trustees coordinated with NMFS SERO's Protected Resources Division to determine that this project does not require authorization under the MMPA.

- A compliance review for impacts to cultural and historical resources protected under Section 106 of the National Historic Preservation Act, including Tribal consultations, has been initiated and will be completed prior to project implementation.

Comment [LG3]: Need section #

Comment [LG4]: check

The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. Public comments and Trustee responses are found in Chapter 15.

Throughout the design process, every practical attempt will be made to avoid and minimize potentially adverse environmental, social, and cultural impacts. The following conservation measures and BMPs (sorted by resource type) will be implemented to minimize impacts to resources:

Green House Gas Emissions

- Shut down idling construction equipment, if feasible.
- Locate staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites.
- Encourage the use of the proper size of equipment for the job to maximize energy efficiency.
- Encourage the use of alternative fuels or power sources for generators at construction sites, such as propane or solar power, or use electrical power where practicable.

Geology and Substrates

- Temporary flotation channel dimensions (e.g., length, depth and width) would be minimized and to the extent practicable, avoided depending on project design and/or construction timing.

- Spoil from temporary flotation channels will be placed on the side of the channel. After installation of the structures is completed, the temporary flotation channels will be filled in mechanically.
- A vibratory hammer from a barge will be used to push piles to a depth ranging from 10 to 30 feet below the substrate. This will put the day board sign at approximately +10.0 Mean Lower Low Water (MLLW).

Hydrology and Water Quality

- The Trustee will apply for a Mississippi Coastal Wetland Protection Act Permit and authorization by the USACE. Under the Coastal Zone Management Act of 1972, selected restoration projects must be consistent with the federally-approved coastal management programs for the states in which the projects are to be conducted. Best management practices along with other avoidance and mitigation measures required by state and federal regulatory agencies, will be employed to minimize potential water quality and sedimentation impacts. Authorization by the U.S. Army Corps of Engineers (USACE) under Section 10/404 and State Water Quality Certifications will be required and permit conditions will be met.

- Appropriate BMPs such as routine maintenance, inspection, and proper refueling of construction equipment will be used to prevent, control, and mitigate impacts.
- Temporary flotation channel dimensions (e.g., length, depth and width) would be minimized and to the extent practicable, avoided depending on project design and/or construction timing.
- Spoil from temporary flotation channels will be placed on the side of the channel. After installation of the structures is completed, the temporary flotation channels will be filled in mechanically.

Submerged Aquatic Vegetation

- To the extent practicable, SAVs will be avoided in the siting and construction of breakwaters, intertidal habitat, subtidal habitat and temporary flotation channels.

Invasive Species

- All equipment to be used during the project, including personal gear, will be inspected and cleaned such that there is no observable presence of mud, seeds, vegetation, insects and other species.
- Reef habitat material will be treated or inspected to remove "non-target" species.

Benthic Infauna and Epifauna

- SAV surveys and where needed oyster/hard bottom and artificial/nearshore reef surveys will be conducted as part of project site refinement.
- For breakwaters, intertidal reef habitat, subtidal reef habitat, and temporary flotation channels effort will be made during design and construction to avoid existing environmentally sensitive areas such as viable productive oyster reefs, emergent marsh and SAVs, and other living communities.
- Temporary flotation channel dimensions (e.g., length, depth and width) would be minimized and to the extent practicable, avoided depending on project design and/or construction timing.

Marine Mammals

- Standard Manatee Conditions (A-D) for In-Water work (USFWS 2011)
- Smalltooth Sawfish and Sea Turtle construction guidelines (NMFS 2006)
- Measures for Reducing Entrapment Risk to Protected Species (NMFS 2012)

Protected Species

<u>Sea turtles mitigation measures (all project components)</u>

- Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006).
- All project work will be in-water and no nesting habitat exists in the project area.

- All construction personnel will be notified of the potential presence of sea turtles in the water and will be reminded of the need to avoid sea turtles.
- If any sea turtles are found to be present in the immediate project area during activities, construction will be halted until species moves away from project area.
- All construction personnel will be notified of the criminal and civil penalties associated with harassing, injuring, or killing sea turtles.
- Train/instruct all construction personnel of what they are to do in the presence of a sea turtle.
- Construction activities will occur during daylight hours and noise will be kept to the minimum feasible.

Shorebirds mitigation measures (all project components)

- All construction personnel will be notified of the potential presence of shorebirds within the project area.
- All construction personnel will be instructed and trained in the protection of shorebirds.
- Construction personnel will be notified of the criminal and civil penalties associated with harassing, injuring or killing shorebirds.
- If piping plovers or red knots are present, work will not occur until the birds have moved from the area by 150 feet.
- Construction noise will be kept to the minimum feasible.

West Indian manatee mitigation measures (all project components)

- Standard Manatee Conditions (A-D) for In-Water Work (USFWS 2011).
- All construction personnel will be notified of the potential presence of West Indian Manatee in the water and reminded of the criminal and civil penalties associated with harassing, injuring, or killing West Indian manatees. All workers will be educated that there could be West Indian manatees in the water and will be advised to look for manatees and, if observed, wait until manatees leave the area to put the equipment in the water.
- Care will be taken when lowering equipment into the water and the sediment in order to ensure that no harm is caused to West Indian Manatee that may potentially be in the water within the construction area.
- Should a West Indian Manatee come within 50 foot of the project area during construction activities, work will immediately cease until the West Indian Manatee has moved away from the project area on its own. Construction noise will be kept to the minimum feasible.

Gulf Sturgeon (Deer Island and Grand Bay project components only)

- To the extent practicable, the Deer Island Subtidal Reef and the Grand Bay Intertidal and Subtidal Reefs project components that are in Gulf Sturgeon Critical habitat, will be limited to the window between May and October, after sturgeon have migrated to their riverine habitat. If work continues beyond the May to October window, continued adherence to the Sea turtle and

Smalltooth Sawfish Construction Conditions (NMFS 2006) will minimize the potential for impacting Gulf Sturgeon.

ESA consultations and MMPA coordination (all project components)

- ESA Section 7 coordination is underway and the appropriate recommendations will be incorporated into the selected project. Because no adverse effects to manatee are expected, the Trustees determined that no take of manatee under MMPA will occur.

Migratory Bird Treat Act/Bald and Golden Eagle Protection Act

- If evidence of eagle nesting is found, within 660 ft. of the project area, coordination with the USFWS will be initiated to develop and implement appropriate conservation measures. Due to the implementation of best management practices no "take" is anticipated.
- If evidence of migratory bird nesting is found, coordination with the USFWS will be initiated to develop and implement appropriate conservation measures.
- Construction noise will be kept to the minimium feasible.

Essential Fish Habitat

- After installation of the structures is completed, the flotation channels would be filled in mechanically.
- All construction activities would be completed during daylight hours.
- Pilings would be driven instead of jetting to reduce the disturbance of bottom sediments and bottom dwelling organisms.
- Monitoring will assess whether unexpected impacts to EFH have occurred.
- If immediate post-construction monitoring reveals that unavoidable impacts to EFH have occurred, appropriate coordination with regional EFH personnel will take place to determine appropriate response measures, possibly including mitigation. If additional adaptive management of the breakwater structure is necessary after monitoring events, all minimization measures discussed above will be followed.

Cultural Resources

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

Land and Marine Management/Coastal Zone Management Act

- Pursuant to the Coastal Zone Management Act of 1972, federal actions must be consistent to the maximum extent practicable with the federally approved coastal management programs for states where the activities will affect a coastal use or resource of the state. The Federal Trustees submitted their consistency determination for this project to MDMR) on May 21, 2015. MDMR replied by letter dated June 29, 2015 with its determination that the selected actions are

consistent with the Mississippi Coastal Program. As noted in that response. additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation.

- The Trustee will coordinate with Grand Bay NERR Staff and NOAA to ensure project consistency with the Grand Bay NERR Management Plan (GBNERR 2013).
- Siting of breakwaters, intertidal reefs, subtidal reefs and temporary flotation channels will avoid monitoring sites.
- Construction will be completed so as not to interfere with management or monitoring activities at Grand Bay NERR. There will be no breakwaters or temporary flotation channels constructed in the Grand Bay NERR.
- Temporary flotation channel dimensions (e.g., length, depth and width) would be minimized and to the extent practicable, avoided depending on project design and/or construction timing.Spoil from temporary flotation channels will be placed on the side of the channel. After installation of the structures is completed, the temporary flotation channels will be filled in mechanically.
- Natural cultch materials (i.e. oyster shells) will be used for intertidal and subtidal cultch placements in the Grand Bay NERR or material approved by the Grand Bay NERR staff.
- Restoration planning may require historical research to determine the "natural" representative state of an estuarine area

Public Health and Safety and Shoreline Protection

- Best management practices in accordance with Occupational Safety and Health Administration (OSHA) and state and local requirements will be incorporated into construction activities onsite to ensure the proper handling, storage, transport, and disposal of all hazardous materials.
- Personal protective equipment will be required for all construction personnel, and authorized access zones will be established at the perimeter of the project site. As a result, adverse impacts to public health and safety will not be expected.

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Chapter 7: Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore

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7.1 Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore

7.1.1 Project Summary

This project involves implementing roadway safety improvements in the Davis Bayou Area of Gulf Islands National Seashore (the Davis Bayou Area). Two intra-project action alternatives were proposed for consideration. The National Park Service Preferred Alternative (Alternative B in this Environmental Assessment (EA)) is to widen the existing road surface on Park Road and Robert McGhee Road to accommodate multiple-use bicycle- pedestrian lanes. The other alternative (Alternative C in the EA) would reduce the amount of automobile traffic in the park by limiting access to VFW Road during certain times of the day. If Alternative B is selected, Phase IV of early restoration would provide funding for construction along Park Road only – i.e. 2.17-miles. The 0.82-mile portion on McGhee Road would be funded – and constructed – separately, but is included here and in the EA as a "connected action."[1]

7.1.2 Background and Project Description

Park Road and Robert McGhee Road are both two-lane roads with no shoulders located in the Davis Bayou Area of Gulf Islands National Seashore (Figure 7-2 and Figure 7-3), managed by the NPS. The Davis Bayou Area is located in Ocean Springs, Mississippi. The first mile of Park Road was constructed over 30 years ago in an existing residential area to serve as the primary access to the William M. Colmer Visitor Center. Robert McGhee Road and Park Road south of VFW Road were in place when the park was Magnolia State Park, before the first mile of Park Road was constructed. In the past 20 years, approximately 10,000 additional residents moved into Ocean Springs. As development has increased, neighboring residents increasingly drive through the park as a shortcut to other destinations. Park Road offers an overpass over the CSX railroad line, which motorists use to avoid temporary blockages caused by passing trains. This road also provides a shorter commuter route to many residences that surround the Davis Bayou Area.

Robert McGhee Road (Route 016), previously known as Hanley Road, provides access to the Davis Bayou Area campground and public use boat dock. Robert McGhee Road also connects to a multiple-use bicycle-pedestrian trail route that extends to Hanley Road, located outside of the park. A portion of the Live Oak Bicycle Trail, a 15.5-mile route within the city of Ocean Springs, also traverses the park along the north part of Robert McGhee Road.

Members of the public – including day users, overnight campers, and commuters just passing through - use these roads as walking, jogging, bicycling, and motor vehicle traffic routes. Motorists are known to

[1] The National Park Service defines connected actions as those that are "closely related" to the proposal and alternatives. Actions are connected if they automatically trigger other actions that may have environmental impacts; they cannot or will not proceed unless other actions have been taken previously or simultaneously; or they are interdependent parts of a larger action and depend on the larger action for their justification (NPS Director's Order 12 Handbook).

drive at excessive speeds that place non-motorized visitors at risk. Simultaneous use of the roads by all user groups results in a high probability for accidents, visitor conflicts, and potentially unsafe conditions for pedestrians, bicyclists, and motorists. Pedestrians and bicyclists using the road corridors within the park area have limited space to maneuver to avoid approaching motorists, as there is little-to-no shoulder space. Additionally, wetlands adjacent to the roadway minimize the extent to which pedestrians and bicyclists can negotiate off-road to avoid collisions with motorists. Motorized traffic also poses risks to park wildlife. High speeds of the motor vehicles increase the number of wildlife collisions on Park Road and Robert McGhee Road.

As such, alternatives were developed to enhance the use of Park and Robert McGhee Roads by bicyclists and pedestrians. Public input was provided and the list of alternatives was refined into two action alternatives, described below.

7.1.2.1 Alternative A: No-action

NEPA requires a consideration of a "No Action" alternative, which has been designated "Alternative A." See section 7.2.4.1 for more details on this alternative.

7.1.2.2 Alternative B: Construct Multiple-Use Trails (Preferred Alternative)

Under the Alternative B the road surface of Park Road (2.17 miles) and Robert McGhee Road (0.82 mile) would be widened to accommodate multi-use travel lanes on one or both sides of the road (Figures 7-1 and 7-4). The new road configuration would widen the existing 22-feet (ft) roadway to an up-to 36-ft paved surface that includes two 11-ft motor vehicle lanes flanked by 2-ft buffers and 5-ft multiple-use lanes. There would also be 4-ft non-paved shoulders flanking the multiple use lanes. Beyond the non-paved shoulders, construction would also include fill in areas, plus five additional feet of clearing, as depicted in the figure below. Retaining walls could also be constructed in areas where the road is elevated higher than the surrounding landforms. The study corridor for this project includes 50 feet from the edge of the paved surface along Park Road and Robert McGhee Road. Therefore, the total width of the study corridor is 122 feet wide. However, where Park Road and Robert McGhee Road cross east Stark Bayou and Stark Bayou, respectively, the study corridor is narrower. This is because, compared to the non-tidal marsh areas, the road is not as high relative to the adjacent landscape and the elevations of road and tidal marsh are much more uniform (flat). As such, the width will be narrower in the tidal marsh than in non-tidal marsh areas, making it easier to predict a maximum width for the project as it goes through the tidal marsh. This total width is 74 ft (26 ft out from each side plus the 22-ft wide road). The boundaries of the study corridor are considered to be the limits of construction.

Final design may result in a narrower corridor and narrower limit of construction where possible as long as the purpose and need of the proposed action is met.

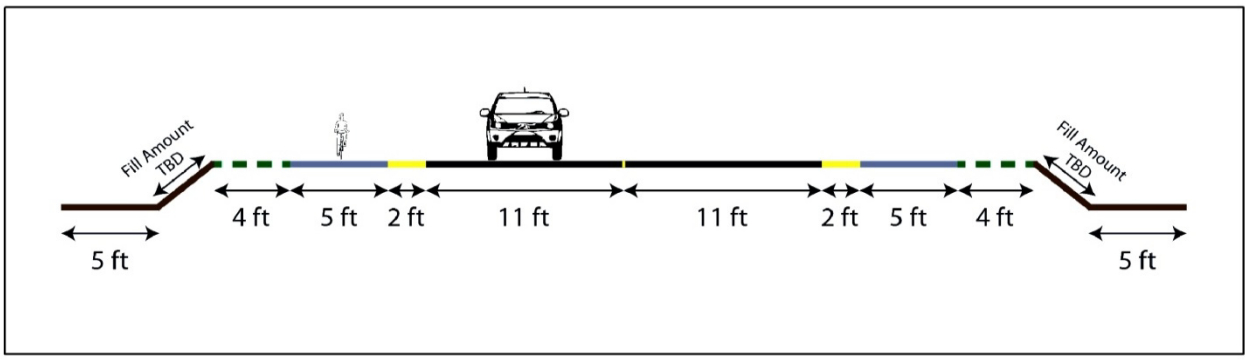


Figure 7-1: Alternative B
Proposed Road Configuration
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service

Under Alternative B, project construction activities would include:

- excavating, grading, filling, and overlaying asphalt to widen the existing paved surface from 22-ft up to 36-ft paved surface with additional 4 ft non-paved shoulders, with appropriate striping;
- ground disturbance beyond the existing asphalt and up to 14 additional feet of asphalt proposed, 8 feet of non-paved shoulders, plus 5 feet from the toe of slopes for construction and heavy equipment maneuvering, thus widening the existing road corridors;
- placing and compacting fill adjacent to roadway including wetland areas;
- installing two traffic-calming medians (e.g., 10-ft wide ellipses) within the first mile of Park Road, similar to the entrance median;
- installing retaining walls along the road in areas where the road is elevated higher than the surrounding land forms;
- installing new or extending several existing culverts;
- removing woody vegetation and mature trees;
- planting native grasses on non-paved shoulders and grasses/trees on bare slopes or in new medians;
- constructing replacement boardwalk over portions of Stark Bayou on Robert McGhee Road, using cantilevers and pilings, with clearance for under-boardwalk wildlife crossings, or replacing the boardwalk with fill for the multiple-use lane; if pilings are selected to be used, 280 8-inch diameter pilings would be used across the 700-foot span on Robert McGhee Road, and 120 8-inch diameter pilings would be used across the 300-foot span on Park Road;
- replacing existing culvert bridge on Park Road over East Stark Bayou with a larger bottomless box culvert or small bridge, with restoration of water flow of wetlands on both sides of the road at culvert location, and possibly eliminating the existing cantilevered boardwalk on the west side of the road;
- conducting wetlands mitigation activities in the forested wetland and the emergent marsh;

- conducting essential fish habitat (EFH) mitigation activities in the estuary by creating one acre of emergent marsh
- avoiding most existing utilities and possible relocating some existing utilities, where needed, (e.g., light poles, cable and phone lines, water hydrants, buried electrical lines and transformers);
- relocating/replacing road signs;
- relocating/replacing guardrails to meet current standards.

Equipment likely to be used includes track hoes, backhoes, graders, dump trucks, compactors, asphalt pavers, and road striping equipment. One lane will likely remain open during the project implementation except for occasional brief closures of both lanes as needed.

In addition, as an action common to both action alternatives, formal entrance park signs will be installed at the VFW Road/Knapp Road intersection, and the entrance sign currently located 150 feet south of the Park Road/U.S. Route 90 intersection will be relocated closer to the intersection, making the sign more visible to passing motorists on U.S. Route 90.

7.1.2.3 Alternative C: Limit Access to VFW Road

Under Alternative C, the existing configuration of Park Road and Robert McGhee Road would remain at the current width. A gate would be installed at the intersection of Knapp and VFW Roads, and VFW Road would be closed to motorists during times of high recreational use on Park Road. Proposed closure times would be from 4pm-7pm Monday-Friday and 8am-12pm Saturday. This alternative would substantially reduce the number of motor vehicles present on the mile of Park Road between U.S. Route 90 and VFW Road during high recreational usage times (Figure 7-5). The gate would permit emergency vehicles to pass through at all hours. There would be no change to the access point off U.S. Route 90. A sign would be posted at the U.S. Route 90 entrance at the Government Street and Knapp Road intersection indicating timed closures of VFW Road, and the speed limit on Park Road would be reduced to 25 MPH from the current speed limit of 35 MPH.

The exact project schedule for Alternative C is currently unknown; however, construction would most likely occur in the fall of 2016.

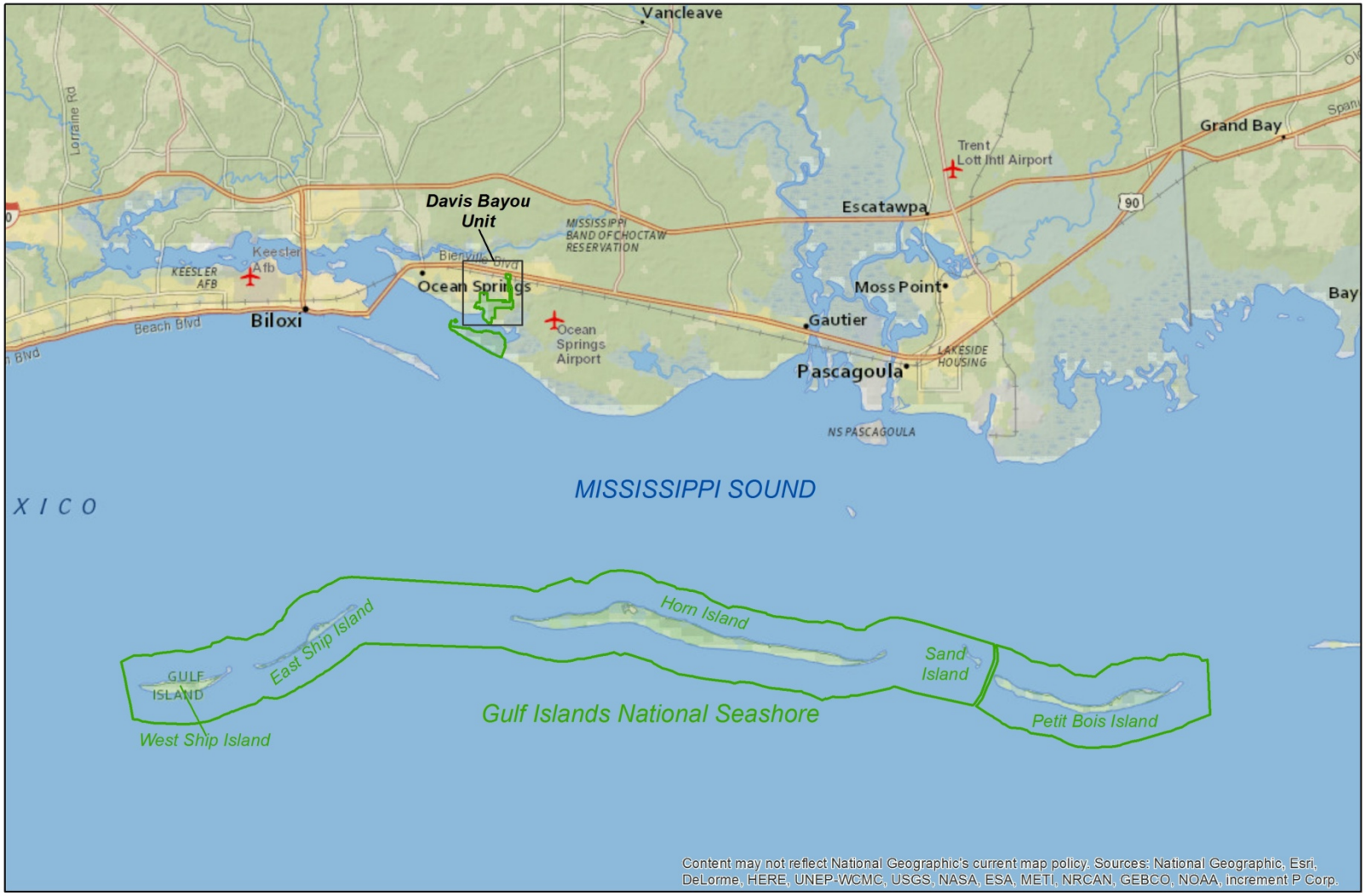
Under Alternative C, project construction activities would include:

- installing two traffic-calming medians (e.g., 10-ft wide ellipses) within the first mile of Park Road, similar to the entrance median;
- widening the road at these two medians in a way that could include grading, filling, paving, installing retaining walls, and removing woody vegetation – though these would be a fraction of what would occur under Alternative B;
- planting native grasses on non-paved shoulders and grasses/trees on bare slopes or in new medians;
- minor ground disturbance on already-disturbed land to install the traffic control gate(s)
- relocating/replacing any road signs in the construction area;

- relocating/replacing guardrails to meet current standards.

Equipment likely to be used includes track hoes, backhoes, graders, dump trucks, compactors, asphalt pavers, and road striping equipment. One lane would likely remain open during the project implementation except for occasional brief closures of both lanes as needed

In addition, as an action common to both action alternatives, formal entrance park signs will be installed at the VFW Road/Knapp Road intersection, and the entrance sign currently located 150 feet south of the Park Road/U.S. Route 90 intersection will be relocated closer to the intersection, making the sign more visible to passing motorists on U.S. Route 90.



Legend

Gulf Island National Seashore Boundary - Mississippi District

Figure 7-2: Site Layout Map
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service

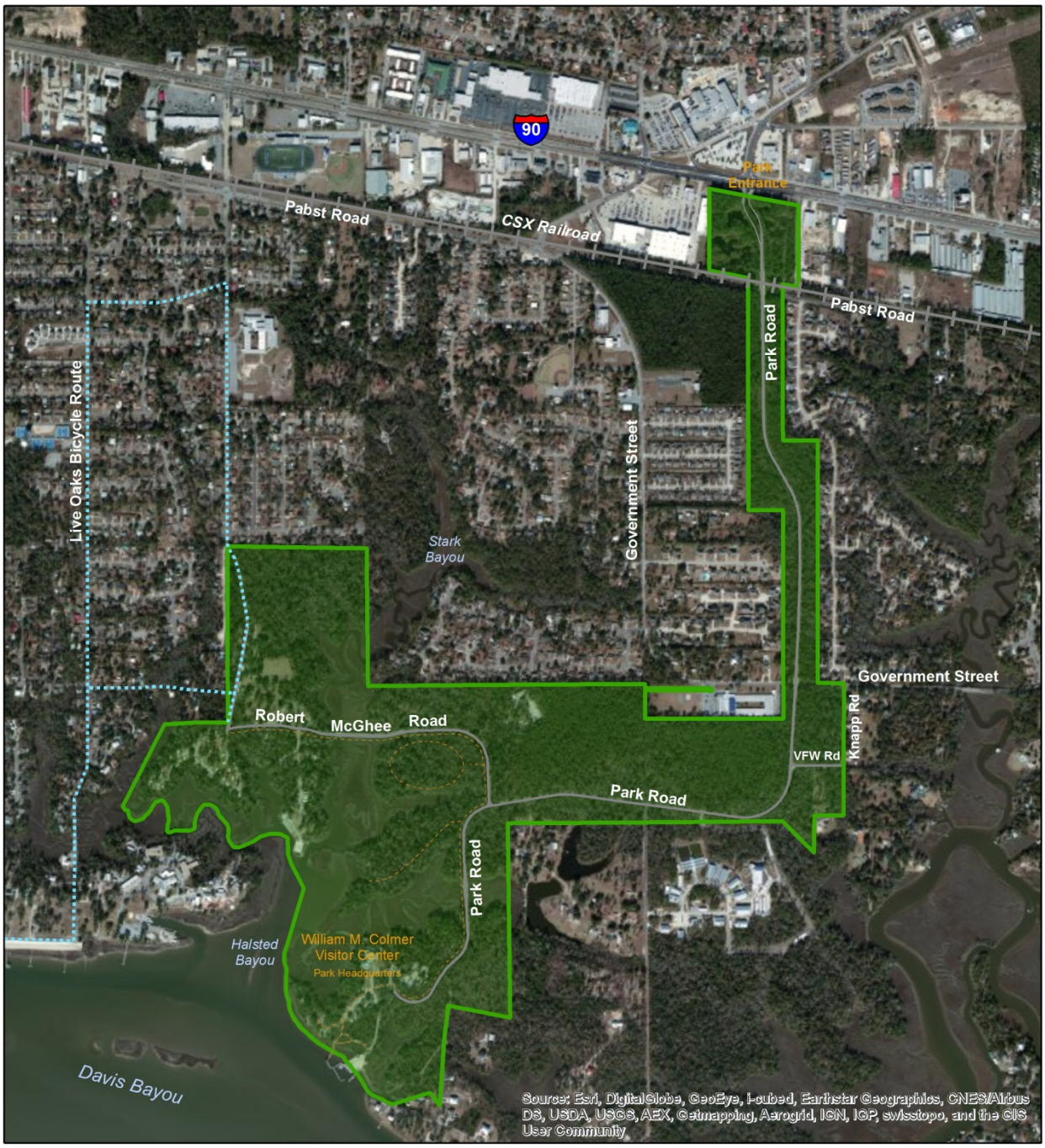
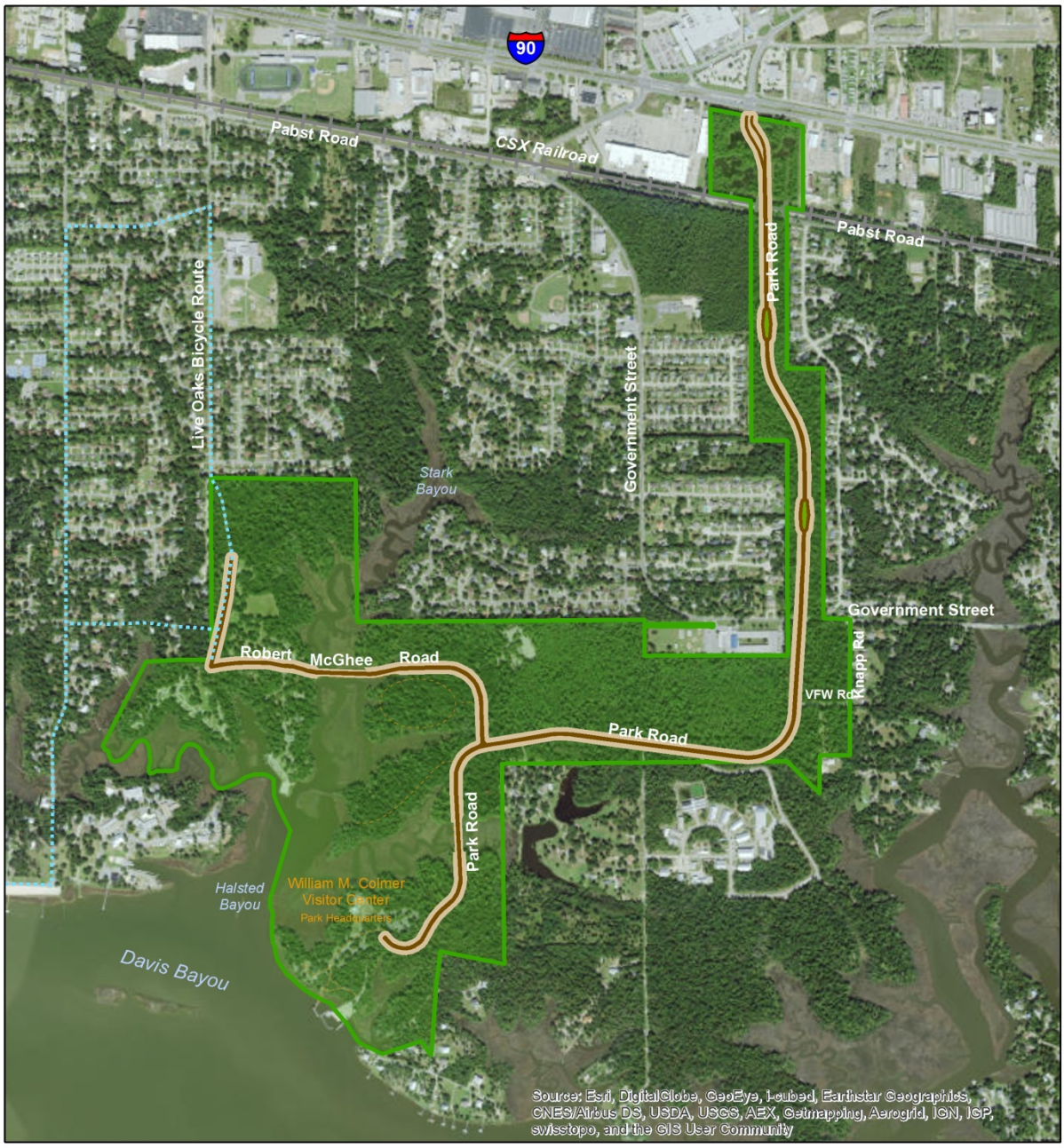


Figure 7-3: Project Area Map
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service



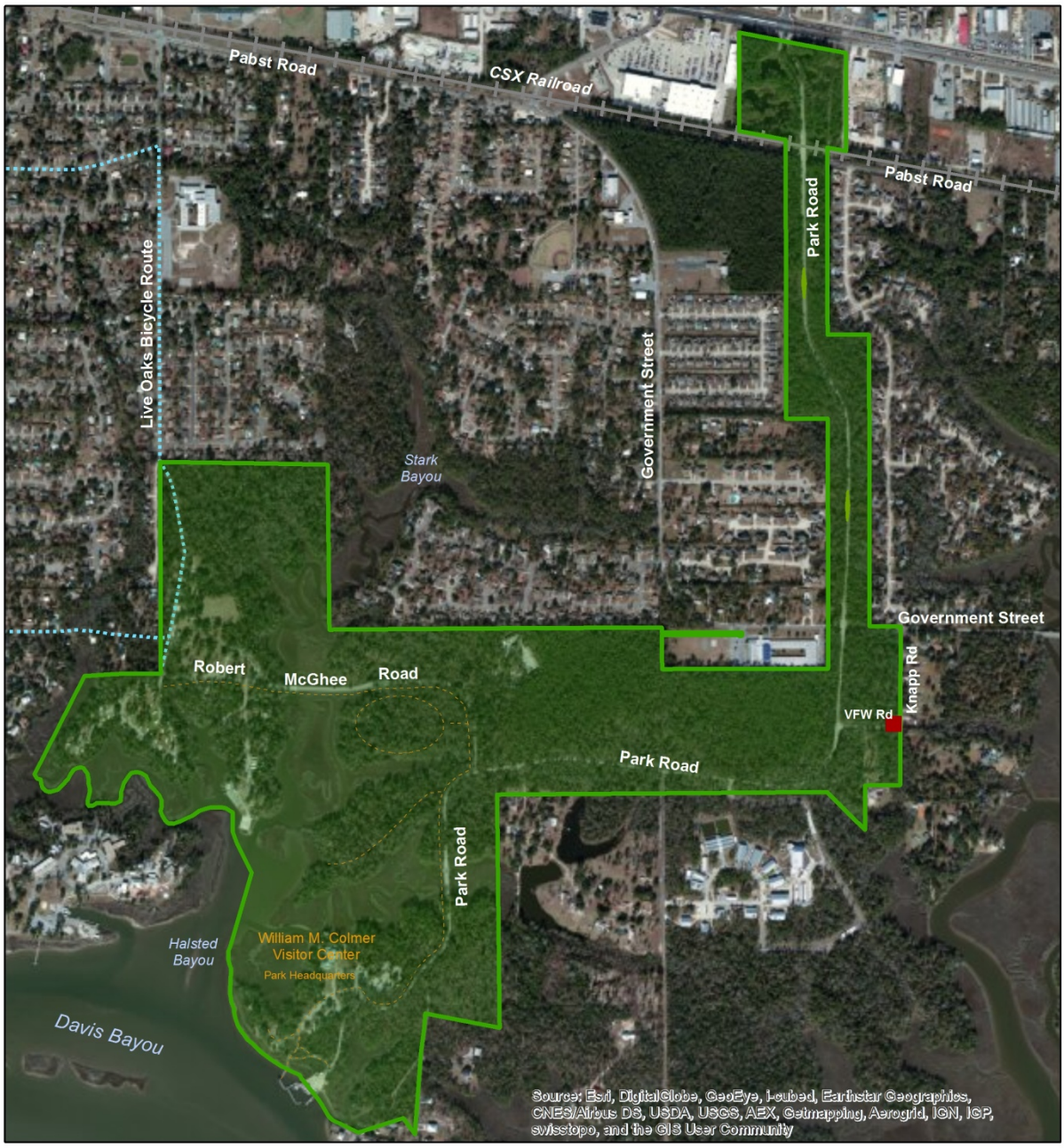
North

0 500 1,000 2,000 Feet

Legend

- Median
- Existing Road Area
- Proposed Road Widening
- Cosntruction Zone
- Project Area Boundary
- Trail
- Live Oak Bicycle Route
- Railroad

Figure 7-4: Alternative B
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service



North

0 500 1,000 2,000 Feet

Legend

- Proposed Gate
- Median
- Existing Road Area
- Project Area Boundary
- Trail
- Live Oak Bicycle Route
- Railroad

Figure 7-5: Alternative C
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service

7.1.3 Evaluation Criteria

This project meets the evaluation criteria established for OPA and the Framework Agreement. The Preferred Alternative will enhance the public's use and/or enjoyment of natural resources by providing a safe place to walk and cycle within the Davis Bayou Area, helping to offset adverse impacts to the recreational uses on DOI-managed lands in the five Gulf States caused by the *Deepwater Horizon* oil spill ("the Spill"). Accordingly, the project is intended to replace or provide recreational opportunities comparable to the types of opportunities lost as a result of the Spill (see C.F.R. § 990.54(a) (2) and Sections 6a-6c of the Early Restoration Framework Agreement).

In addition to enhancing the public's use and enjoyment of natural resources, the project will provide habitat benefits by increasing the capacity under the East Stark Bayou Bridge for greater water flows. Accordingly, the project also benefits more than one resource and/or service. See 15 CFR § 990.54 (a)(5). The project is technically feasible and utilizes proven road and bicycle/pedestrian path construction techniques with well-established methods and document results and can be implemented with minimal delay. For these reasons, the project has a high likelihood of success. See CFR § 990.54(a)(3) and Section 6e of the Early Restoration Framework Agreement.

A thorough environmental review, including review under applicable environmental statutes and regulations, is described in Section 7.2.7; that review shows that adverse effects from the project will largely be minor, localized, and often of short duration. In addition, the best management practices (BMPs) and measures to avoid or minimize adverse effects described for each resource topic under the Alternative B analysis will be implemented. As a result, collateral injury will be avoided and minimized during project implementation (15 CFR § 990.54(a)(4)).

Cost estimates are based on similar past projects where fill, retaining walls, a new bridge, in-water work, utility relocations, etc. are involved; based on these estimates the project can be conducted at a reasonable cost. See CFR § 990.54(a)(1). As a result, the project is considered feasible and cost effective. The project is not inconsistent with more comprehensive restoration needs for the Spill (see CFR§ 990.54(a)(1),(3), and Sections 6d-6e of the Early Restoration Framework Agreement).

7.1.4 Performance Criteria and Monitoring

The overall goal of this project is partially restore lost recreation on DOI-managed lands in the five Gulf States caused by the Spill by improving future visitor use and experience at the Davis Bayou Area. This will be accomplished by improving the visitor safety experience on Davis Bayou Area roads by implementing the Preferred Alternative described above. The project will be deemed successful once actions are taken to enhance the use of Park Road (and later Robert McGhee Road) for bicyclists and pedestrians. This will be done by reducing the number of interactions between them and motor vehicles. As such, performance criteria for this project are: a) the project is constructed and completed as designed; and b) bicyclists and pedestrians are regularly using the enhanced areas. These criteria can be easily monitored and confirmed through site inspections, contract oversight and visual observations of use after project completion. See Appendix B for the project Monitoring Plan.

7.1.5 Maintenance

Under Alternative B, additional maintenance will be required, as the additional surface for the multiple use trails will need to be cleared of debris, and vegetation along the lanes will need to be cut back to give pedestrians and cyclists a clean and clear path. Under Alternative C, the gates that would be installed would have associated routine maintenance to ensure they remain in operable condition. Maintenance costs will not be covered by the project's funding.

7.1.6 Offsets

The Trustees and BP negotiated a BCR of 2.0 for the recreational use project. The natural resource damage Offsets for the Bike-Pedestrian Use Enhancements Project are $13,993,502, expressed in present value 2014 dollars to be applied against the monetized value of lost recreational use provided by natural resources injured on lands managed by the U.S. Department of the Interior (DOI) in the five Gulf states, which will be determined by the Trustees' assessment of lost recreational use for the Spill. Please see Section 4.4 of this document for a description of the methodology used to develop monetized Offsets.[2]

7.1.7 Estimated Costs

The estimated cost of Alternative B for construction of multiple-use bicycle-pedestrian lanes on both Park and Robert McGhee Roads is $11,103,928. The estimated cost of Alternative C is $668,000. If Alternative B were selected, the park will receive $6,996,751 as part of the Phase IV Early Restoration effort to construct bicycle-pedestrian lanes on Park Road only. (Funding for any work on Robert McGhee Road would come from some other source.) This cost reflects cost estimates developed from the most current information available to the Trustees at the time of project negotiation. Costs include provisions for planning, designing, and implementing.

[2] For the purposes of applying the natural resource damage Offsets to the calculation of injury after the Trustees' assessment of lost recreational use for the Spill, the Trustees and BP agree as follows:

- The Trustees agree to restate the natural resource damage Offsets in the present value year used in the Trustees' assessment of lost recreational use for the Spill.
- The discount rate and method used to restate the present value of the natural resource damage Offsets will be the same as that used to express the present value of the damages.

7.2 Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore: Environmental Assessment

The proposed Bike and Pedestrian Use Enhancements project involves improving the experience of bicyclists and pedestrians on Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore. It would do so by implementing one of the alternatives described below.

7.2.1 Introduction and Background, Purpose and Need

7.2.1.1 Introduction

CEQ encourages federal agencies to "tier" their NEPA analyses from other applicable NEPA documents to create efficiency and reduce redundancy, and has issued new guidance on the use of programmatic NEPA documents for tiering (79 *FR* 76986, December 23, 2014).

Tiering has the advantage of not repeating information that has already been considered at the programmatic level so as to focus and expedite the preparation of the tiered NEPA review(s). When a programmatic environmental assessment (PEA) or programmatic environmental impact statement (PEIS) has been prepared and an action is one anticipated in, consistent with, and sufficiently explored within the programmatic NEPA review, the agency need only summarize the issues discussed in the broader statement and incorporate discussion from the broader statement by reference and concentrate on the issues specific to the subsequent tiered proposal (CEQ 2014).

A federal agency may prepare a PEIS to evaluate broad actions (40 C.F.R. §1502.4(b); see Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18026 (1981)). When a federal agency prepares a PEIS, the agency may "tier" subsequent narrower environmental analyses on site-specific plans or projects from the PEIS (40 C.F.R. § 1502.4(b); 40 C.F.R. §1508.28). Federal agencies are encouraged to tier subsequent narrower analyses from a PEIS to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review (40 C.F.R. § 1502.20). The 2014 Final Programmatic and Phase III Early Restoration Plan and Programmatic Environmental Impact Statement (Phase III ERP/PEIS) was prepared for use in tiering subsequent early restoration plans and projects, such as Phase IV.

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the programmatic portions of the Phase III ERP/PEIS. This EA qualifies for tiering from the Phase III ERP/PEIS in accordance with Department of the Interior regulations (43 CFR 46.140, Using tiered documents) under "b" and "c".

This project is consistent with the Phase III ERP/PEIS' Preferred Alternative as described in the 2014 Record of Decision (79 *FR* 64831-64832 (October 31, 2014)) and the Trustees find that the conditions and environmental effects described in the broader NEPA document (with updates as described in Chapter 2) are valid. Specifically, this project tiers to the analyses found in two sections of the PEIS: Development and Evaluation of Alternative, Section 5.3.5.1; and Early Restoration Programmatic Plan: Development and Evaluation of Alternatives" (Section 5.3.5.1) and "Environmental Consequences,"

Section 6.5.1, Project Type 10: Enhance Public Access to Natural Resources for Recreational Use, Improving access to natural resources for recreational use through the construction or enhancement of infrastructure. This EA incorporates by reference the analysis found in the PEIS in those sections; see specific language, by impact topic, in the Environmental Consequences section below. This EA also incorporates by reference all Early Restoration introductory, process, background, and Affected Environment information and discussion provided in the PEIS (Chapters 1 through 6). See Chapters 1-4 in this Phase IV document.

7.2.1.2 Background

Park Road and Robert McGhee Road are both two-lane roads with no shoulders located in the Davis Bayou Area of Gulf Islands National Seashore (Figure 7-2 and Figure 7-3), managed by the National Park Service. The Davis Bayou Area is located in Ocean Springs, Mississippi. The first mile of Park Road was constructed over 30 years ago in an existing residential area to serve as the primary access to the William M. Colmer Visitor Center. In the past 20 years, approximately 10,000 additional residents moved into Ocean Springs. As development has increased, neighboring residents increasingly drive through the park as a shortcut to other destinations. Park Road offers an overpass over the CSX railroad line, which motorists use to avoid temporary blockages caused by passing trains. This road also provides a shorter commuter route to many residences that surround the Davis Bayou Area.

Robert McGhee Road (Route 016), previously known as Hanley Road, provides access to the Davis Bayou Area campground and public use boat dock. Robert McGhee Road also connects to a multiple-use bicycle-pedestrian trail route that extends to Hanley Road, located outside of the park. A portion of the Live Oak Bicycle Trail, a 15.5-mile route within the city of Ocean Springs, also traverses the park along Robert McGhee Road.

Members of the public – including day users, overnight campers, and commuters just passing through - use these roads as walking, jogging, bicycling, and motor vehicle traffic routes. Motorists are known to drive excessive speeds that place non-motorized visitors at risk. Simultaneous use of the roads by all user groups results in a high probability for accidents, visitor conflicts, and potentially unsafe conditions for pedestrians, bicyclists, and motorists. Pedestrians and bicyclists using the road corridors within the park area have limited space to maneuver to avoid approaching motorists, as there is little room beyond the edge of the road to traverse. Additionally, wetland areas adjacent to the roadway minimize the extent to which pedestrians and bicyclists can negotiate off-road to avoid collisions with motorists. Motorized traffic also poses risks to park wildlife. High speeds of the motor vehicles increase the number of wildlife collisions on Park Road and Robert McGhee Road.

7.2.1.3 Purpose and Need

The purpose and need for this action falls within the scope of the purpose of and need for early restoration as described in the programmatic portions of the Final Phase III ERP/PEIS because it would accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. The proposed project's purpose is to partially restore recreation lost on DOI-managed lands in the five Gulf States as a result of the Spill. The proposed project is needed to enhance the use of the Davis Bayou

Area of Gulf Islands National Seashore by bicyclists and pedestrians in particular; this includes making their experiences safer and more enjoyable. Current use of this area is impacted in the following ways:

- The use of Park Road and Robert McGhee Road by pedestrians, bicyclists, and motorists results in visitor conflicts and potential unsafe operations for all three user groups;
- Traffic on Park Road has increased by approximately 500 cars a day since the 2010 installation of a traffic light at the US Route 90 intersection, raising safety concerns;
- The road corridor does not have a paved shoulder and therefore, there is limited space for pedestrians and bicyclists to maneuver to avoid approaching motorists;
- Adjacent wetlands minimize the extent to which pedestrians and bicyclists are able to negotiate off road attempts to avoid collisions with motorists;
- Future development, including on private properties whose only road access is via Park Road, is expected to increase the traffic on Park Road.

An EA is needed to evaluate the environmental impacts of these proposed safety improvements. This EA has been prepared in accordance with the requirements of the National Environmental Policy Act of 1969, as amended, and its implementing regulations (40 CFR 1500-1508), and NPS Director's Order #12, *Conservation Planning, Environmental Impact Analysis, and Decision-Making* and accompanying DO-12 Handbook (NPS 2001).

7.2.2 Scope of the Environmental Assessment

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the Phase III ERP/PEIS. The broader environmental analyses of these types of actions as a whole are discussed in the Final Phase III ERP/PEIS from which this EA is tiered. The information and analyses in this document supplements the programmatic analyses with site-specific information. This EA provides NEPA analysis for potential impacts for site-specific issues and concerns anticipated from implementation of the two intra-project action alternatives and the no action alternative.

Specifically, this EA evaluates bicyclist and pedestrian use enhancements in the Davis Bayou Area of the park with three intra-project alternatives; a No-Action Alternative (Alternative A), widen the existing road surface on Park Road and Robert McGhee Roads to accommodate multiple use lanes (Alternative B, the Preferred Alternative), and reduce the amount of automobile traffic in the Davis Bayou Area by limiting access to VFW Road during certain times of the day (Alternative C). (Note: the format of this EA is different from others in the Phase IV ERP. Since there are two action alternatives for this project, the Affected Environment section comes first, separate from the Environmental Consequences section. After that, the environmental consequences of each alternative are presented separately. The action alternatives were initially developed by GUIS staff, presented to the public for review and comment, and refined by GUIS staff into the two action alternatives.)

The following options were considered during the early stages of the planning process but were dismissed because they 1) do not meet the purpose and need and/or the objectives of the project, 2) would violate law or policy, or 3) would contribute to other resource concerns. Not all of these options encompass an entire alternative, but rather were components of the alternatives.

Installation of traffic-calming devices only - As a means to reduce traffic speeds in the park, one alternative considered was to exclusively utilize traffic-calming devices. During early planning stages, the National Park Service decided to incorporate the use of traffic-calming devices into both action alternatives rather than carry this option forward as a standalone alternative.

Changes to the park entrance - An alternative to establish an entrance fee (residents excepted) and construct a manned entrance station just south of the island at the north end of Park Road (off of US Route 90) was considered in the early planning stages as a way to reduce traffic volume and safety concerns. VFW road would become a one-way street for exiting the park only (excluding emergency vehicles that would have been granted two-way access). This alternative was not considered further due to concerns addressed during scoping regarding the visitor experience, community relations, and park operations.

Work with other agencies to establish an alternate route to highway 90 - An alternative was proposed to construct a two-way ramp in the southwest quadrant of the intersection of Park Road and Pabst Road. The ramp would have provided access to Pabst Road without having to use the at-grade railroad crossing at Ocean Spring Road. This alternative would have also worked with the Federal Highway Administration and the state of Mississippi to develop a route to Highway 90 that kept community residents and Gulf Coast Research Laboratory personnel off Park Road. Due to the fact that this alternative would have required the use of lands outside the boundary and beyond the jurisdiction of Gulf Islands National Seashore, these actions would have been dependent upon cooperation with other agencies, outside funding, and additional permitting concerns and was therefore not considered further.

Construct a multi-use trail separate from Park Road - An alternative to construct a multi-use trail separate from Park Road was considered. This alternative was not carried forward due to the potential for substantial adverse impacts to wetlands in the area proposed for the trail configuration and due to the fact that the projected costs would be prohibitive and dependent upon outside funding sources.

One-way traffic routes - Two alternative variations were considered that would have established one-way traffic on the major park roadways and opened Hanley Road as an exit route for traffic on Park Road. It was anticipated that these configurations would result in traffic increases on Robert McGhee and Hanley Roads, which would have adversely impacted visitor safety and park operations and caused controversy in the community. Due to these concerns and the fact that these alternatives did not best meet the project purpose and need, they were not considered further.

Multiple use lanes from VFW Road to the visitor center and on Robert McGhee Road - An alternative was considered to construct a multi-use trail along Robert McGhee Road and on Park Road between VFW Road and the visitor center. Due to the similarity between this alternative and the proposed Alternative B, this alternative was not considered further.

7.2.3 Project Location

Gulf Islands National Seashore encompasses barrier islands and coastal mainland and surrounding waters in Mississippi and Florida and includes 12 separate land areas stretching along 160 miles from

Cat Island in Mississippi to the eastern end of Santa Rosa Island in Florida. The Davis Bayou Area of Gulf Islands National Seashore, which encompasses approximately 470 acres, is located in Ocean Springs, Jackson County, Mississippi (Figure 7-2).

7.2.4 Project Scope

7.2.4.1 Alternative A: No-Action/Continue Current Management

Under the No-Action Alternative, the National Park Service would continue to use and maintain the existing configuration (i.e., two 11-foot [ft] one-way lanes with no paved shoulder) of Park Road and Robert McGhee Road within the Davis Bayou Area of the park. There would be no changes to NPS maintenance, enforcement, and operating activities and no anticipated changes to traffic levels or community and visitor use. Alternative A represents a continuation of the existing condition and provides a baseline for evaluating impacts of the action alternatives.

7.2.4.2 Alternative B: Construct Multiple Use Trails (Preferred Alternative)

Under Alternative B, the road surface of Park Road (2.17 miles) and Robert McGhee Road (0.82 mile) would be widened to accommodate multiple use travel lanes on one or both sides of the road (Figure 7-4). The new road configuration would widen the existing roadway from 22-ft to up to 36-ft paved surface to include two 11-ft motor vehicle lanes flanked by 2-ft buffers and 5-ft multiple use trails (Figure 7-1). There would also be 4-ft non-paved shoulders flanking the multiple use lanes. In areas where fill is added along the existing road, the footprint of that slope would extend out the least extent possible (distance is currently unknown due to uncertainty of design), and there would be a 5-ft equipment work area extending out from the toe of the slope. Retaining walls could also be constructed in areas where the road is elevated higher than the surrounding landforms. For a description of project details, see the Timelines and Methodology section above. The study corridor for this project includes 50 feet from the edge of the paved surface along Park Road and Robert McGhee Road. Therefore, the total width of the study corridor is 122-ft wide (i.e., 50 ft plus 22 ft of existing pavement plus 50 ft). However, where Park Road and Robert McGhee Road cross east Stark Bayou and Stark Bayou, respectively, the study corridor is narrower. This is because, compared to the non-tidal marsh areas, the road is not as high relative to the adjacent landscape and the elevations of road and tidal marsh are much more uniform (flat). As such, the width will be narrower in the tidal marsh than in non-tidal marsh areas and it's easier to predict a maximum width for the project as it goes through the tidal marsh. This total width is 74 ft (26 ft out from each side plus the 22-ft wide road). The boundaries of the study corridor are considered to be the limits of construction.

Note: Consultation with NOAA NMFS pursuant to the Magnuson-Stevens Fishery Conservation and Management Act for potential impacts to essential fish habitat (EFH) resulted in the addition of a mitigation element to the project scope after the Draft Phase IV ERP/EA was publicized. A one-acre marsh creation project within the NPS boundary of the Davis Bayou Area has been added to the scope to offset potential adverse impacts to essential fish habitat from construction. Consultation found that the project could destroy up to 0.69 acres of EFH. To mitigate these impacts 1.5 times the area being

adversely impacted– (i.e., 1.035 acres, or one acre) will be created. For the impacts along Park Road, this equals 0.35 acres (i.e., 1.5 x 0.23), and for the impacts assumed along Robert McGhee Road, this equals 0.69 acres (i.e., 1.5 x 0.46). The Park Road section would be accomplished under the NRDA funded portion of the project, and the remainder when the Robert McGhee Road portion of the project is funded, designed, and implemented. Approximately three acres of sediment material borrow areas will be needed to provide material to create the entire one acre of marsh for mitigation.

Revegetation details for the created marsh will be determined before mitigation is implemented; however, some details can be prescribed now. Plant material will come from plant donor sites in the park or be purchased from nurseries and will be planted on no greater than six-ft centers. Only species and forms (e.g., sprigs, bare roots, plugs, gallon containers) that are appropriate for the sites will be planted. Plant material will meet the required genetic specifications. Planting will occur after the dredged material has had time to consolidate sufficiently (approximately three months).

The potential impacts from the marsh creation project are included in the project's environmental consequences analyses below.

7.2.4.3 Alternative C: Limit Access to VFW Road

Under Alternative C, the existing configuration of Park Road and Robert McGhee Road would remain at the current width. A gate would be installed at the intersection of Knapp and VFW Roads. During times of high recreational use on Park Road, VFW Road would be closed to motorists (Figure 7-5). Proposed closure times would be from 4pm-7pm Monday-Friday and 8am-12pm Saturday. This alternative would substantially reduce the number of motor vehicles present on the mile of Park Road between U.S. Route 90 and VFW Road during high recreational usage times. The gate would permit emergency vehicles to pass through at all hours. There would be no change to the access point off U.S. Route 90. A sign would be posted at the U.S. Route 90 entrance and Government Street / Knapp Road Intersection indicating timed closures of VFW Road.

7.2.4.4 Elements Common to Action Alternatives B and C

Under each of the action alternatives, NPS would implement the following actions:

- The speed limit throughout the park would be reduced to 25 miles per hour or less;
- Two traffic-calming medians (e.g., 10-ft diameter ellipses) would be installed along the first mile of Park Road;
- All proposed infrastructure and improvements would be handicapped accessible and comply with the Americans with Disabilities Act of 1990;
- The project would address and comply with all appropriate Federal Highway Administration safety recommendations in the Safety Study for Gulf Islands National Seashore Davis Bayou Area dated March 2014;
- Access would continue to be provided to all private residences, buildings, and private roads that stem off of Park Road within the park, including Gollott Avenue, Laurel Oak Drive, Quave Road, and Eagle Point Road;

- NPS road maintenance activities would increase. Maintenance actions would include such things as sweeping the multiple use lanes to remove gravel and sand, and trimming of vegetation encroachment along the roadways to reduce safety conflicts with pedestrians, bicyclists, and motorists as well as wildlife;
- Additional signage to increase public awareness regarding the Davis Bayou Area's status as a NPS unit would be increased. Signage would be installed at the Park Road entrance off of U.S. Route 90 and at the VFW Road entrance.

7.2.5 Operations and Maintenance

Under Alternative B, additional maintenance would be required, as the additional surface for the multiple-use lanes would need to be cleared of debris, and vegetation along the road would need to be cut back to give pedestrians and cyclists a clean and clear path. Eventual re-paving and re-striping of the multiple-use lanes would also be needed. Under Alternative C, the gates that would be installed would have associated routine maintenance to ensure they remain in operable condition.

Project funds would not be used for future operation and maintenance costs.

7.2.6 Affected Environment

Under the National Environmental Policy Act, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources of the project. For more detailed discussions of impact topics throughout Gulf Islands National Seashore, refer to the 2014 Final General Management Plan/Environment Impact Statement, or click on 2014 GMP (NPS 2014a).

7.2.6.1 Physical Environment

7.2.6.1.1 Geology and Substrates

The proposed project area is the Davis Bayou Area of the park near Ocean Springs, Mississippi (Figure 7-3). The Mississippi Sound separates the Mississippi mainland from the offshore barrier island chain. The Davis Bayou shoreline is relatively young in age and formed during the late Pleistocene and Holocene Epochs (approximately 11,000 years ago to present). The surface formations include the Prairie formation, which formed the level floodplains, and the Gulfport Formation, which formed a wide belt of beach ridges.

In general, the soil at Gulf Islands National Seashore can be described as greatly weathered and leached, with little organic material, low natural fertility, and highly acidic (NPS 2014a). The Prairie Formation, in most cases, underlies the Mississippi Marshes and is a thick (14.7-39 feet) blanket of alluvial deposits composed of muddy and clayey fine sands and moderately silty, fine, and very fine sands (Otvos 2001). Near the surface, the soil is very pale orange, yellowish-orange, and medium-orange oxidation colors. The Gulfport formation grades upward from muddy, poorly sorted sandy near shore neritic deposits to subtidal shoal sands to higher intertidal and finally eolian sands (Otvos 2001). Shoreline ridge deposits were mainly caused by ocean and wind, so they are devoid of clay and silt. Soils in the Davis Bayou Area

were generally formed under well-drained upland forests of oak, pine, holly, and magnolia as well as cordgrass and blackrush marshes. These soils are still forming as grassy vegetation and wetland plant material accumulates and decomposes (NPS 2014a).

The climate is warm with abundant rainfall. The soil in the project area retains moisture throughout the year creating favorable conditions for decomposition as well as increased chemical processes in the soil. The high rainfall also leaches soluble bases and nutrients downward. The general topography of the area is nearly level with some gentle sloping areas. Sandy and loamy marine deposits have given rise to similar texture soils. On the sand ridges where the water table is deep and soils are leached, plant nutrients and organic matter are carried rapidly downward through the sandy soils. Topography immediately adjacent to Park Road associated with the bridge approaches north of VFW Road is steep with a 20% grade over a distance of approximately 70 feet.

7.2.6.1.2 Hydrology, Water Quality, and Floodplains

Hydrology

This section looks at the movement and distribution of surface water and groundwater in the study area. The Davis Bayou Area, which encompasses approximately 470 acres, empties fresh water into Davis Bayou and eventually the Mississippi Sound by draining adjacent marshes, including Halstead and Stark bayous (NPS 2005). The study area overlies the coastal lowlands aquifer system. This large aquifer system ranges from Texas into Mississippi (USGS 2009). Water in the aquifer becomes increasingly saline as it moves toward the coast mainly due to an increase in dissolved solids. The aquifer ranges in age from Oligocene to Holocene (USGS 2009). The NPS reported a well, located in the Davis Bayou Area of the National Seashore, which measured water levels below the land surface from 1938 to 1990 (NPS 2014a). The well recorded the water level at 2-4 feet below the land surface in the middle of the last century and 70-80 ft toward the end of the data collection period. A hydrologic study was conducted in the project area that determined ground and surface water flow toward the wet pine savanna and southward (NPS 2002).

Surface and Ground Water Quality

Mississippi Department of Environmental Quality (MDEQ) reports on surface and ground water quality by providing technical reviews of physical/chemical, bacteriological, biological, and/or toxicological data. MDEQ provides this information to the U.S. Environmental Protection Agency and it is available to the public. A list of “impaired waters” is prepared every two years, the most recent report was 2014 and none of the waters associated with the study area (Figure 7-4) were listed (MDEQ 2014). As in all areas of human development, there are water quality concerns related to erosion of exposed soil, deterioration of riparian vegetation, and runoff from paved areas where pollutants can be transported (oil, etc.) into low-lying areas and eventually to surface and ground water.

Floodplains

Flooding in the Davis Bayou Area of Gulf Islands National Seashore can range from minor events from high tides to major flooding from hurricanes and other coastal storms. Heavy precipitation can also flood

low elevation areas. As demonstrated by Hurricane Katrina, the area is extremely vulnerable to coastal flood events. In Mississippi, the Katrina storm surge was 25 to 28 feet above normal tide and the surge damage reached several miles inland (NOAA 2012). The Davis Bayou Area of Gulf Islands National Seashore supports a number of natural features that reduce the severity of flooding. For example, coastal wetlands and bayous provide various functions, such as storage and sediment retention and dissipation of energy during flooding events. Wetlands and other depressions also function to store water during overwash or heavy precipitation.

Portions of the project area are within the mapped 100-year and 500-year floodplains, as shown on Federal Emergency Management Agency Flood Insurance Rate Map numbers 28059C0292G, 28059C0293G, and 28059C0294G (FEMA 2009). The Federal Emergency Management Agency defines geographic areas as flood zones according to varying levels of flood risk. Each zone reflects the severity or type of flooding in the area, as depicted on Figure 7-6. The first zone, labeled "AE" on the Federal Emergency Management Agency maps, is within the 100-year floodplain and the base flood elevation ranges from 16-18 ft National Geodetic Vertical Datum of 1988 (NAV88). This zone encompasses mostly the southern portion of the Davis Bayou Area. The major source of flooding in this area would be flooding from overwash in the bayous. This zone would contain Class I floodplains. The second zone on the Federal Emergency Management Agency mapping is zone "X (Other Flooded Areas)," designated for areas of 0.2% annual chance flood or areas of 1% annual chance flood with average depths of less than 1 feet or less of drainage areas less than 1 square mile. The third zone is also zone "X (Other Areas)," areas determined to be outside the 0.2% annual chance floodplain and less likely to flood than the 100-year floodplain or the Other Flooded Areas. Zone "X (Other Areas)" occurs in the northern portion of the study area (Figure 7-6). The final zone, VE (Coastal Flood Zone), extends from offshore to the inland limit of a primary frontal dune along an open coast and any other area and is subject to high velocity wave action from storms. No project activities are proposed in zone VE.

A Floodplain Statement of Findings was prepared in accordance with Executive Order 11988 (Floodplain Management), NPS Director's Order #77-2, and Floodplain Management and Procedural Manual #77-2. See Appendix E.

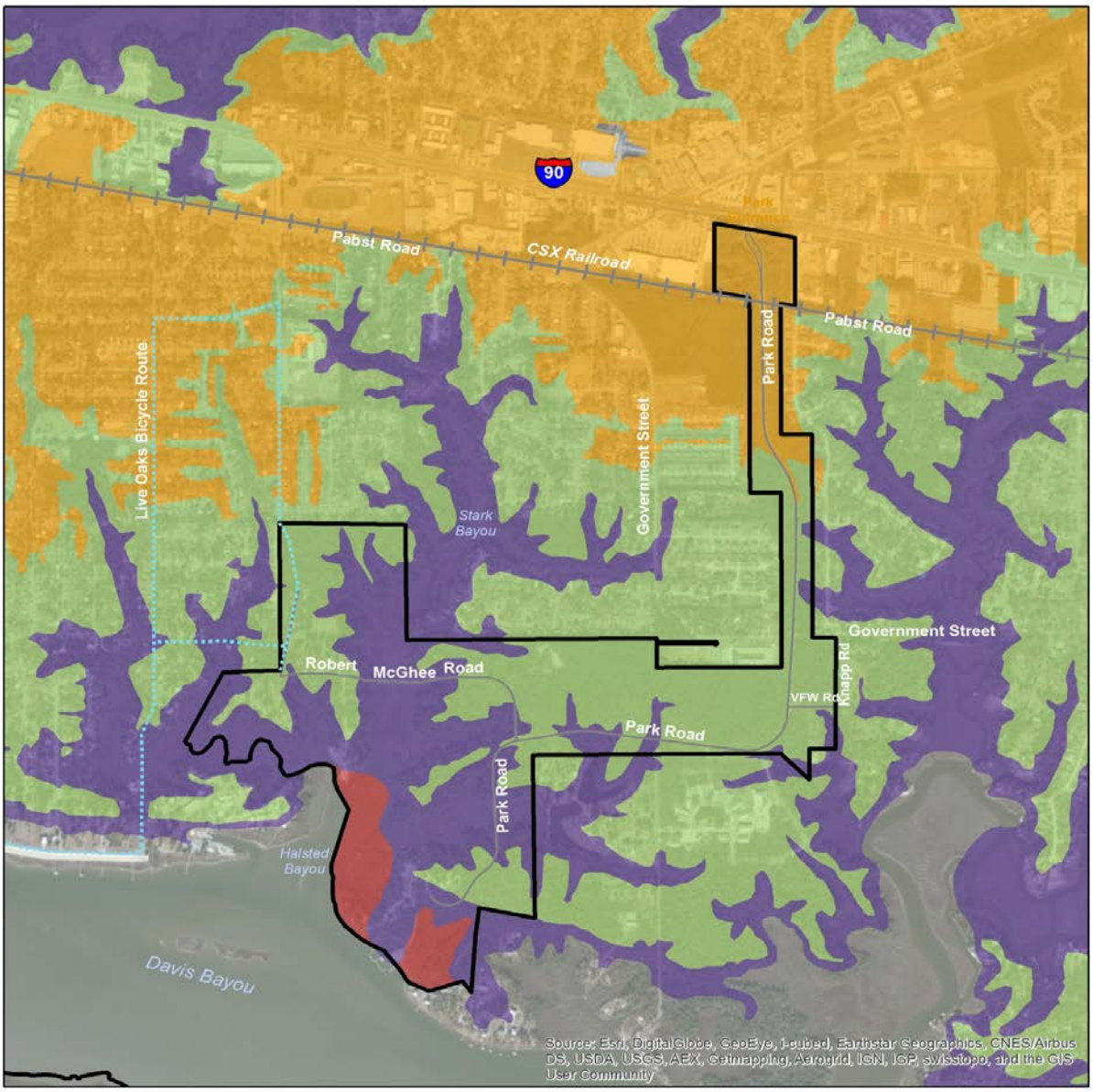


Figure 7-6: Floodplain Map
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service

7.2.6.1.3 Air Quality and Greenhouse Gas Emissions

Gulf Islands National Seashore is subject to both federal and Mississippi air regulations. The Federal Clean Air Act (42 U.S.C. 7401-7671q) requires the U.S. Environmental Protection Agency (USEPA) to establish a series of national Ambient Air Quality Standards (NAAQS) for air quality throughout the United States. Individual states can adopt the NAAQS or establish state ambient air quality standards, which cannot be less stringent than the NAAQS. The Mississippi Department of Environmental Quality is responsible for ensuring the Mississippi District of Gulf Islands National Seashore meets federal obligations of the Clean Air Act. The Mississippi Department of Environmental Quality uses the NAAQS as duly promulgated by the USEPA (11 Mississippi Administrative Code Pt. 2 Chapter 4).

Both the State of Mississippi and federal primary ambient air quality standards for criteria air pollutants are presented in Table 7-1.

Table 7-1. State and Federal Ambient Standards for Criteria Air Pollutants

POLLUTANT	AVERAGING PERIOD	FEDERAL AND STATE STANDARD
Ozone	8-hour	0.075 ppm
PM 2.5	Annual (Arithmetic Mean)	15.0 µg/m^3
	24-hour	35 µg/m^3
PM 10	Annual (Arithmetic Mean)	NA
	24-hour	150 µg/m^3
Carbon Monoxide	8-hour	9 ppm
	1-hour	35 ppm
Nitrogen Dioxide	Annual (Arithmetic Mean)	0.053 ppm
	1-hour	0.100 ppm
Sulfur Dioxide	Annual (Arithmetic Mean)	0.03 ppm
	24-hour	0.14 ppm
Lead	Annual (geometric mean)	0.15 µg/m^3
	24-hour	1.5 µg/m^3
Source: USEPA 2014, 11 Mississippi Administrative Code Pt. 2 Chp. 4		

Under the terms of the 1990 Clean Air Act amendments, the National Seashore is designated as a Class II airshed. By definition, Class II areas of the country are set aside for protection under the Clean Air Act. Protection is somewhat less stringent than in Class I areas. Under Class II, modest increases in air pollution are allowed beyond baseline levels for particulate matter, sulfur dioxide, nitrogen, and nitrogen dioxide, provided the NAAQS are not exceeded (NPS 2008).

Greenhouse gases (GHG) consisting primarily of water vapor, carbon dioxide, methane, nitrous oxide, and ozone absorb and trap heat in the atmosphere. In the U.S., the primary source of GHG is the burning of fossil fuels for electricity and transportation. Carbon dioxide is the main GHG emitted and accounted for 82% of U.S. GHG emissions in 2012 (USEPA 2012).The Council on Environmental Quality has requested that federal departments and agencies consider the effects of GHG emissions in their National Environmental Policy Act reviews. The proposed Council on Environmental Quality screening level is 25,000 metric tons of carbon dioxide-equivalent emissions annually. If this level is exceeded, an assessment of GHGs should be included in the National Environmental Policy Act assessment. Currently, GHG emissions are not monitored or collected at the park.

The proposed action area is located in Jackson County, Mississippi, which is currently in attainment for all criteria air pollutants (sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, particulate matter equal to or less than 10 microns in size, fine particulate matter equal to or less than 2.5 microns in size, and lead) (USEPA 2015).

7.2.6.1.4 Noise

Noise can be defined as unwanted sound, and noise levels and impacts are interpreted in relationship to its effects on nearby residents or organisms. The existing background noise environment is known as ambient noise and can be generated by a number of sources, including mobile (airplanes, motor vehicles) and stationary sources (industrial operations). The Noise Control Act of 1972 (42 U.S.C. 4901 to 4918) was enacted to establish noise control standards and to allow the federal government to regulate noise emissions from commercial products such as transportation and construction equipment. Noise levels are measured in A-weighted decibels, a logarithmic scale that approaches the sensitivity of the human ear across the frequency spectrum.

The primary sources of ambient (background) noise in the project area are the operation of motor vehicles and voices and natural sounds such as wind and wildlife. The levels of noise in the project area varies, depending on the season and/or the time of day, the number and types of sources of noise, and distance from the sources of noise.

Noise-sensitive receptors include sensitive land uses and those individuals and/or wildlife that could be affected by changes in noise sources or levels due to the project. Noise-sensitive land uses in the project area include residences and campground visitors.

7.2.6.2 Biological Environment

7.2.6.2.1 Living Coastal and Marine Resources

The Davis Bayou Area is approximately 470 acres (including water body acreage). Three marshy bayous, including Halstead, Stark (crossed by Robert McGhee Road), and East Stark Bayou (crossed by Park Road) flow through the study area and discharge into Davis Bayou to the south and eventually to the Mississippi Sound. Elevations in the Area range from sea level to over 20 ft; vegetative cover varies from tidal herbaceous plants to upland hardwoods (Mississippi State University 2002).

Seven major vegetated habitat types were identified as occurring within the Davis Bayou Area. The southern mixed hardwood forest occupies the high sandy ridges located throughout the southern portion of the unit. Interspersed between these ridges are bayhead swamp wetlands that subsequently flow into tidal marshes that are part of the Davis Bayou watershed. Where southern mixed hardwood forested areas lie adjacent to tidal marshes, a transitional wet forest occurs on the sloping areas between them where soils are hydric. Hydric soils are defined as those soils that are sufficiently wet in the upper part to develop anaerobic conditions during the growing season. The maritime forest habitat type lies directly adjacent to Davis Bayou. Wet pine flatwood and wet pine savanna habitats occupy the relatively flat topography of the northern portion of the unit, largely on either side of the entrance road (Park Road). Bayhead swamps are interspersed within this area as well (Mississippi State University 2002). No seagrass beds occur in the project area (NPS 2014a).

Wetlands

Much of the vegetation between the ocean and the uplands at Gulf Islands National Seashore is considered tidal marsh, discussed below, and analyzed within the "Terrestrial Vegetation and Wildlife" section of this EA. According to NPS Director's Order 77-1, the wetlands procedural manual, the National Park Service adheres to the Cowardin et al. 1979 wetlands classification scheme. In the Mississippi District, wetlands are found in the Davis Bayou Area that are dammed or blocked by roadways and culverts, resulting in the unnatural ponding and retention of water. The National Park Service adheres to a "no net loss" of wetlands policy, as well as other federal and agency policies.

In December 2013 and March 2015, wetlands scientists with the assistance of personnel from the Gulf Islands National Seashore Science and Resources Stewardship Division and the NPS Southeast Regional Office conducted field delineations of wetland features within a 50-ft buffer of the proposed project area (Figure 7-4). The wetlands delineation was conducted in accordance with the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987), Regional Supplement to the U.S. Corps of Engineers Wetlands Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0), and the National Park Service Procedural Manual #77-1: Wetland Protection (National Park Service 2012). (A Wetlands Statement of Findings was prepared in accordance with Executive Order 11900 (Protection of Wetlands), NPS Director's Order #77-1, and Wetland Protection Procedural Manual #77-1. (See Appendix E).

Wetland boundaries were determined by evaluating the presence or absence of wetland indicators at two or more "observation points" (OP). The boundary was mapped between an OP evaluated as an upland location and an OP evaluated as a wetland. Delineated wetlands were identified using the Cowardin classification system (Cowardin et al. 1979). Under this classification, the wetlands present in the Davis Bayou Area were placed into estuarine (non-oceanic wetlands influenced by tidal flows) intertidal emergent, palustrine (fresh water wetland systems) emergent, palustrine scrub shrub, and palustrine forested.

The field delineation efforts mapped 7.3 acres of wetlands within 50 feet of the existing Park Road and Robert McGhee Road (i.e., the 122 foot study corridor) except over the estuary crossings where the study corridor width was 74 ft. (26 ft. out from each side plus the 22-ft wide road). Of the 7.3 acres of delineated wetlands, up to 2.9 acres of potentially U.S. Army Corps of Engineers jurisdictional wetlands could be impacted by the proposed actions (Figure7-7). Table 7-2 depicts the amount of wetlands delineated in the study corridor by Cowardin classification.

Table 7-2. Wetland amounts by classification within the study corridor

WETLAND CLASSIFICATION	AREA IN 122-FT STUDY CORRIDOR
Estuarine Intertidal Emergent (E2EM1)	0.69 acres
Palustrine Emergent (PEM1)	0.4 acres
Palustrine Scrub-Shrub (PSS1)	0.1 acres
Palustrine Forested (PFO1 & PFO4)	6.1 acres

The boundaries of the wetlands identified in this study are not fully contained within and extend outside the study corridor. The areas that extend outside the study corridor are similar in biological and physical characteristics as the areas delineated in the study corridor. Therefore, tidal marsh is present beyond the study corridor where estuarine emergent wetlands were identified and wet pine flatwoods are present beyond the study corridor where palustrine forested wetlands were identified. The Davis Bayou Area is estimated to have approximately 164 acres of wetlands and 120 acres of bayou (NPS 2000).

Wetland habitat types delineated include tidal marshes (salt and brackish) located along tidal bayous, bayhead swamps that constitute the upper reaches of small drainage systems, wet pine savannas located within flat, poorly drained sites, and transitional wet forest located on the sloping wet soil areas between tidal marsh and adjacent upland areas. The acreage of each of these types of wetland found in the Davis Bayou Area is presented in Table 7-3.

Table 7-3. Acreage of Wetland Types present in the Davis Bayou Area

WETLAND TYPE	AMOUNT IN DAVIS BAYOU AREA
Estuarine Intertidal Emergent (E2EM1)	52 acres
Bayhead Swamp (PFO1)	20 acres
Wet Pine Savanna (PFO4)	74 acres
Transitional Wet Forest (PFO1)	18 acres
Source: NPS 2000	

Estuarine Intertidal Emergent Wetlands

The salt marsh community in the Davis Bayou Area is comprised of the three arms of Stark Bayou. Within the study corridor, the tidal salt marshes of East Stark Bayou crossed by Park Road, and Stark Bayou crossed by Robert McGhee Road. These estuarine emergent wetlands are composed of wet and salt tolerant grasses and sedges growing along the fringe of intertidal flats that are exposed to the ebb and flow of the daily fluctuating ocean tides (NPS 2014a). This community occurs in relatively protected niches and drainage basins and creates a transition from open water to the emerging land. Because this vegetation community must tolerate daily flooding and saline conditions, relatively few species grow in this environment, and the subtypes or zones within this community are often composed of nearly pure stands of a single species (NPS 2014a). 52 acres of tidal marsh is present in the Davis Bayou Area (NPS 2000).

Palustrine Forested Wetlands

Bayhead swamps occur on mucky silt loams within the Davis Bayou Area. These areas are forested wetlands found at or near the heads of smaller tributaries of large drainage basins or as the main part of smaller or local drainage systems. These wetlands drain quickly following rains. Commonly occurring trees include sweet bay magnolia, swamp black gum (*Nyssa biflora*), red bay (*Persea palustris*), red maple (*Acer rubrum*), slash pine (*Pinus elliioti*), and sweetgum (*Liquidambar styraciflua*). Common shrubs include wax myrtle, large gallberry (*Ilex coriacea*), and swamp titi. The ground or herb layer commonly consists of cinnamon fern (*Osmunda cinnamomea*), royal fern, netted chain fern (*Woodwardia areolata*), lizard's tail (*Saururus cernuus*), sphagnum moss (*Sphagnum* spp.), with occasional grasses and sedges. This habitat typically drains almost completely after rain events. Fire is not an apparent controlling factor in this habitat type, occurring only in dry conditions. Soils are hydric, composed primarily of sand with varying smaller amounts of silt and clay (NPS 2014a).

Freshwater marshes include the freshwater entrance ponds at the north end of the Davis Bayou Area that were created when soil was removed from those areas to construct the first mile of Park Road in the early 1980s. These areas are permanently flooded to intermittently exposed wetland depressions. The relatively high water table and associated lateral seepage through the coarse sandy soils is the primary source for the water that fills and maintains these wet depressions. Frequent rains also play an important role in recharging water levels in these depressions and providing an additional fresh water source. Soils are predominantly sandy, oftentimes with muddy and organic deposits on the bottom. Water depths tend to be relatively shallow, averaging 1 to 3 feet deep, although depths as much as 9 feet were observed in some ponds (NPS 2014a).

Vegetation in these ponds can vary considerably from densely vegetated to sparse, depending on history of formation and frequency of disturbance. Salinity levels can also be a determining factor in species variances. Most emergent species are restricted to the shallow margins at the edges of these ponds. The most common species include rushes and sedges along with marsh pennywort (*Hydrocotyle umbellate*), cattail (*Typha spp*.), sawgrass (*Cladium jamaicensis*), marsh fleabane (*Pluchea odorata*), royal fern (*Osmunda regalis*), swamp rose mallow (*Hibiscus moscheutos*), and Carolina redroot

(*Lachnanthes tinctoria*). Woody species may include buttonbush (*Cephalanthus occidentalis*), marsh elder, gallberry (*Ilex glabra*), swamp titi (*Cyrilla racemiflora*), sweetbay magnolia (*Magnolia virginiana*), wax myrtle (*Myrica cerifera*), and groundsel (NPS 2014a).

Wet pine savannas are open grasslands with scattered pines that occur on poorly drained, flat terraces of the lower coastal plain region of the southeast. This habitat belongs to a broad group of pine-dominated forests referred to as "flatwoods" that include pine flatwoods, southern mixed hardwood forest, and longleaf pine-turkey oak forest. In the study corridor within the Davis Bayou Area, this habitat can be found north of Park Road between VFW Road and Gollott Avenue. As with all flatwood habitat types, longleaf pine is the dominant tree, and a periodic fire (three- to five-year cycle) helps to maintain this and numerous other fire-adapted species. Trees are typically widely spaced or absent in the wettest sites. In absence of fire, slash pine may become more dominant and, along with shrubs, create a dense canopy that limits understory vegetation. Although large individual slash pines can survive "cool" ground fires, this species does not have a fire resistant "grass" stage like the longleaf pine. Under natural conditions of periodic fire, longleaf pine is the only common tree species that thrives. In the absence or suppression of fire, slash pine, red maple, sweet bay magnolia, and red bay may become more common, as well as shrubs like common gallberry (*Ilex glabra*), large gallberry, yaupon, wax myrtle, and swamp titi (NPS 2014).

Transitional wet forests occupy a zone of transition from one habitat type to another. In the case of the Davis Bayou Area, this community occupies the wet soil slopes between upland ridges and Davis Bayou intertidal areas. In the study corridor, these areas are palustrine wetlands found along the perimeter of the estuarine emergent wetlands at the Robert McGhee Road crossing of Davis Bayou. This habitat designation was recognized to account for the wet soil areas delineated up slope of the adjacent tidal marshes that were clearly not affected by the normal tidal action. Groundwater seeping from the upland ridges is the apparent source of water responsible for the wet soil conditions. Although similar to bayhead swamps in general characteristics, this habitat type can also include vegetation found in the adjacent mixed hardwood forest. The effect of fire in this habitat is unknown. Although similar to bayhead swamps in vegetation and soil characteristics, the upland proximity to fire-susceptible southern mixed hardwood forest may expose them to periodic fire. As with bayhead swamps, these habitats may support fire only under dry conditions (NPS 2014).

Emergent and Terrestrial Habitat

Southern mixed hardwood forest

The southern mixed hardwood forest community is a pine-dominated upland habitat commonly occupying sites on high sandy ridges that includes a variety of hardwood species and a varied assemblage of understory trees and shrubs. This habitat is the typical upland habitat found in the Davis Bayou Area. In addition to longleaf pine (*Pinus palustris*) and loblolly pine (*Pinus taeda*), the canopy layer of the mixed hardwood forest may include beech (*Fagus grandifolia*), laurel oak (*Quercus hemispherica*), southern magnolia (*Magnolia grandiflora*), live oak (*Quercus virginiana*), white oak (*Quecus alba*), sweetgum, water oak (*Quercus nigra*), southern red oak (*Quercus falcate*), pignut hickory (*Carya glabra*), black gum (*Nyssa sylvatica*), and post oak (*Quercus stellata*). Sweetgum, water oak, and black gum are

commonly understory trees, particularly as saplings, along with flowering dogwood (*Cornus florida*), tree huckleberry (*Vaccinium arboretum*), American holly (*Ilex opaca*), red maple, and black cherry (*Prunus serotina*). Common shrubs include yaupon (*Ilex vomitoria*), squaw huckleberry (*Vaccinium stamineum*), and horse sugar (*Symplocus tinctoria*). Poison ivy (*Toxicodendron radicans*), catbriar (*Smilax* spp.), and grape (*Vitis* spp.) are also common (NPS 2014a).

There are many large, mature live oak trees along Park Road and Robert McGhee Road. These large trees provide canopy over the roads in some locations, and carry an aesthetic value.

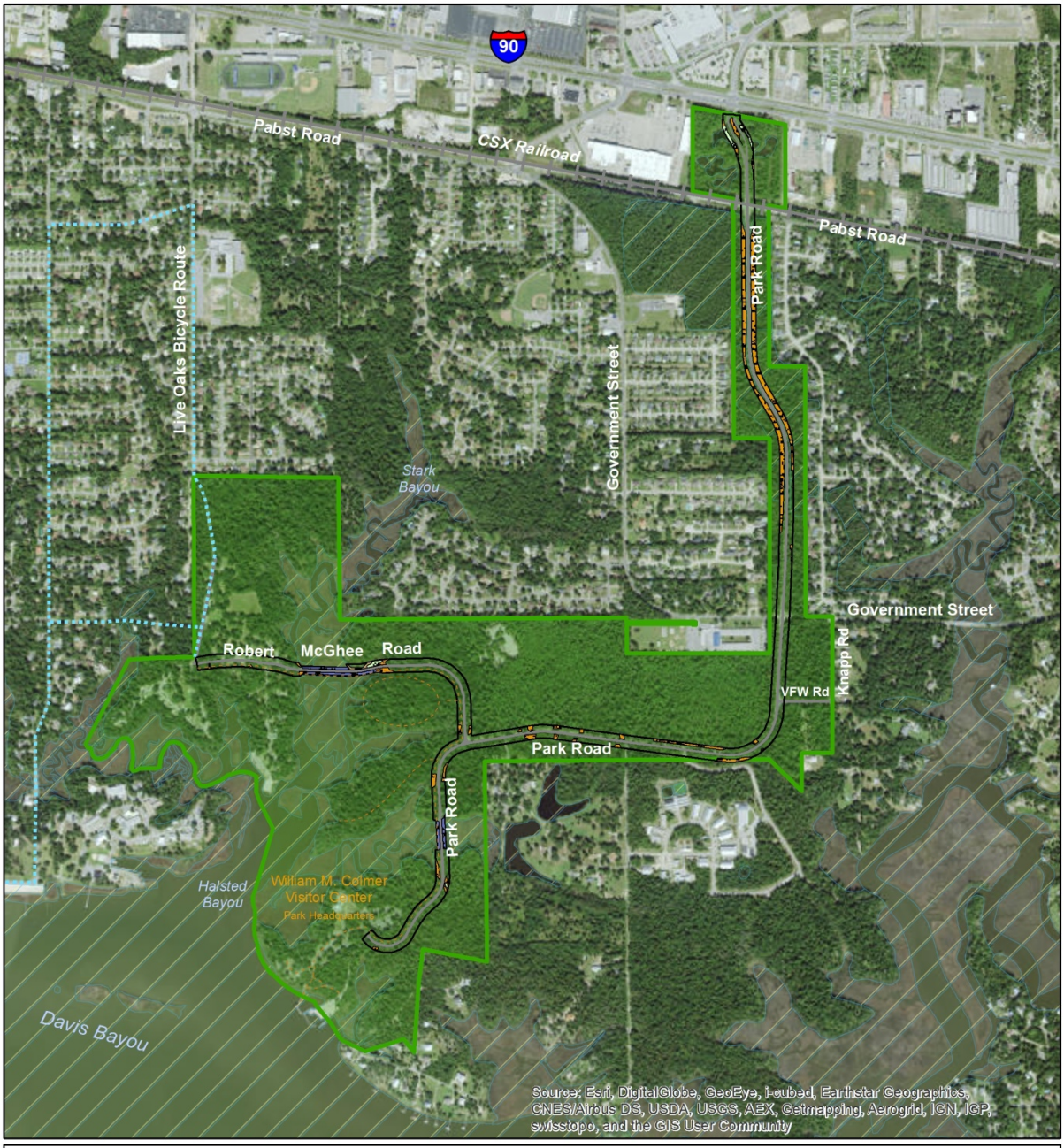
Wildlife and Wildlife Habitat

Smaller native mammal species with the potential to be found in the Davis Bayou Area include marsh rabbit (*Sylvilagus palustris*), eastern cottontail rabbit (*Sylvilagus floridanus*), opossum (*Didelphis virginiana*), squirrels, skunks, gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), eastern wood rats (*Neotoma floridana*), hispid cotton rats (*Sigmodon hispidus*), eastern moles (*Scalopus aquaticus*), southeastern pocket gophers (*Geomys pinetis*), short-tailed shrews (*Blarina carolinensis*), nine-banded armadillo (*Dasypus novemcinctus*), and a variety of bats. River otters (*Lontra canadensis*) can also be found in Davis Bayou.

Common amphibians and reptiles found in the National Seashore include several species of frogs and toads, Gulf Coast Salt Marsh snake (*Nerodia clarkia*), corn snake (*Pantherophis guttatus*), Gulf Coast box turtle (*Terrapene carolina major*), Diamondback terrapins (*Malaclemys terrapin*), eastern glass lizard (*Ophisaurus ventralis*), anoles (*Anolis* spp.), five lined skink (*Plestiodon fasciatus*), and American alligator (*Alligator mississippiensis*) (NPS 2014a).

Approximately 150 bird species were identified at the Davis Bayou Area in 2013 and 2014 (ebird.org 2015). Birds use the area for loafing, nesting, feeding, wintering, or migratory rest stops. These birds include songbirds, waterfowl, wading birds, birds of prey, marine birds, and shorebirds. Clapper rails (*Rallus crepitans*), which are indigenous to salt marshes, and night herons nest and roost in Davis Bayou.

Nonnative wildlife species found in Davis Bayou include Norway rat (*Rattus norvegicus*), nine-banded armadillo (*Dasypus novemcinctus*), wild hogs, and black rat (*Rattus rattus*). Nonnative aquatic organisms, including certain species of jellyfish, clams, crabs, fish, and snails were introduced and continue to be introduced to Gulf waters from discharged ballast sediment and water used in the shipping industry. This practice presents international issues for exotic, nonnative introductions of potentially invasive and/or harmful organisms. Similar to the management of nonnative plant species, nonnative wildlife species are managed to benefit overall ecosystem health, and impacts on individual species are considered where appropriate (NPS 2014a).



North

0 500 1,000 2,000 Feet

Legend

- Estuarine Emergent
- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub
- Study Corridor
- Project Area Boundary
- NWI Wetlands
- Road
- Trail
- Live Oak Bicycle Route
- Railroad

Figure 7-7: Project Area Wetlands within the Study Corridor Gulf Islands National Seashore

U.S. Department of Interior/ National Park Service

Fish and Fish Habitat

The Davis Bayou Area serves as an important nursery for saltwater fish, shrimp, mullet, blue crabs and other species and is influenced by tidal flows. More than 200 species of fish have been observed in waters surrounding the park. The most abundant fish species are the anchovy (*Anchoa* spp.) and the silverside (*Menidia* spp.); both species are also abundant in the shallow nearshore waters. Myriad larval and young fish occupy the shallow waters around the bayou shoreline and find food and protection in estuarine vegetation (NPS 2011).

Silversides are abundant in the shallow nearshore waters of the Davis Bayou Area. These small species, among others, provide food for larger predators. Killifish, sailfin molly, and mosquito fish live in ponds and lagoons, and along Davis Bayou. Myriad larval and young fish occupy the bayou and shallow waters around the shore. These include most of the important sport and commercial species that spawn farther offshore and spend the early parts of their lives in estuarine nursery areas. Several commercially and recreationally important species are within the waters of Davis Bayou. Speckled seatrout (*Cynoscion nebulosus*) spawn in the bayou and are often the most sought-after sport fish. Red Drum (*Sciaenops ocellatus*), sand seatrout (*Cynoscion arenarius*), flounder (*Paralichthys albigutta*), are other species often found in the waters surrounding the Davis Bayou Area. Several species of shellfish that are of commercial, recreational, and ecological importance are in the bayou waters, including blue crabs (*Callinectes sapidus*), shrimp, and stone crabs (*Menippe mercenaria*) (NPS 2014a).

Other invertebrates of ecological importance exist within the waters of Gulf Islands National Seashore, although EFH has not been designated for these species. These species include horseshoe crab (*Limulus polyphemus*), mole crab (*Emerita benedicti*), fiddler crab, hermit crab, coquina, several species of conch, oyster drill, and various copepods, isopods, and amphipods.

Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) set forth a mandate for NMFS, regional Fishery Management Councils (FMC), and other Federal agencies to identify and protect EFH of economically important marine and estuarine fisheries. To achieve this goal, suitable fishery habitats need to be maintained. EFH in the area of proposed action is identified and described for various life stages of managed fish and shellfish in the northern Gulf (GMFMC 1998). A provision of MSFCMA requires that FMC's identify and protect EFH for every species managed by a Fishery Management Plan (FMP) (U.S.C. 1853(a)(7)). There are FMP's in the Gulf region for shrimp, red drum, reef fishes, coastal migratory pelagics, and highly migratory species (e.g., sharks). Table 7-4 includes species from Ecoregion 3 that will be found in emergent marsh and soft bottom habitat ($\leq$ 1m deep) – the two relevant EFH within the area of proposed action.

Table 7-4. EFH within the vicinity of the Proposed Area of Effect – Emergent Marsh and Soft Bottom habitat

COMMON NAME	SPECIES	LIFESTAGE
Red Drum	Sciaenops ocellatus	Larvae – Adults
Gray Snapper	Lutjanus griseus	Adults
Lane Snapper	Lutjanus synagris	Early and Late Juvenile
Brown shrimp	Penaues aztecus	Early Juvenile
White shrimp	Penaues setiferus	Early Juvenile

Tidal Salt Marshes (includes emergent marsh and soft bottom)

The salt marsh community (E2EM1) in the Davis Bayou Area is comprised of the three arms of Stark Bayou. Within the study corridor, the tidal salt marshes are East Stark Bayou crossed by Park Road, and Stark Bayou crossed by Robert McGhee Road. These estuarine emergent wetlands are composed of wet and salt tolerant grasses and sedges growing along the fringe of intertidal flats that are exposed to the ebb and flow of the daily fluctuating ocean tides. This community occurs in relatively protected niches and drainage basins and creates a transition from open water to the emerging land. Because this vegetation community must tolerate daily flooding and saline conditions, relatively few species grow in this environment, and the subtypes or zones within this community are often composed of nearly pure stands of a single species (NPS 2014). 52 acres of tidal marsh is present in the Davis Bayou Area (NPS 2000).

7.2.6.2.2 Protected Species

Federally Listed Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) lists species as threatened or endangered when they meet criteria detailed under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. §1531 *et seq*.). Additionally, Mississippi Wildlife Fisheries and Parks (MWFP) and NOAA National Marine Fisheries Service (NMFS) identify and list protected species. Section 7(a)(2) of the ESA requires that each federal agency ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of those species. Harming such species includes not only directly injuring or killing them, but also disrupting the habitat on which they depend. When the action of a federal agency may affect a protected species or its critical habitat, that agency is required to consult with either the NMFS or the USFWS, depending upon the protected species that may be affected. Endangered Species Act Section 7 consultations have been completed with both USFWS (USFWS 2015) and NMFS (NOAA 2015b). The appropriate recommendations will be incorporated into the proposed project.

This section fulfills the National Park Service's obligation under Section 7 of the Endangered Species Act to document federally listed species and impacts of the Preferred Alternative (Alternative B) to these species via a biological evaluation form submitted to the USFWS for informal consultation and conference (DOI 2015) and used for coordination with NMFS. Table 7-5 lists the species of concern known to be present in the Davis Bayou Area of the National Seashore. Additional species are found throughout Gulf Islands National Seashore, but are not present in the study corridor and would not be affected by the proposed action. For a list of these species refer to the 2014 Final General Management Plan/Environment Impact Statement, or click on 2014 GMP (NPS 2014a). Different agencies have different categories for classification of species, as indicated in the heading and columns of Table 7-5.

Table 7-5. List of Protected Species known to be present within the Davis Bayou Area of Gulf Islands National Seashore

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	MS RANK	PREFERRED HABITAT
Birds				
Haliaeetus leucocephalus	Bald Eagle	DM		In the vicinity of lakes, rivers, marshes, and along sea coasts. Nesting usually occurs in areas with mature trees near large bodies of water. No nest in the Davis Bayou Area
Pelecanus occidentalis	Brown Pelican		S1	Feed in shallow waters within 20 miles of the shoreline.
Reptiles				
Alligator mississippiensis	American Alligator	SAT		Present in wetlands in the study corridor.
SAT = Similarity of Appearance (Threatened); DM = Delisted, Monitored; S1 = critically imperiled *Source:* USFWS 2015; Mississippi Museum of Natural Science 2001.				

The bald eagle (*Haliaeetus leucocephalus*) is found in the vicinity of marshes and along the coast in the Mississippi District of the National Seashore; however, there are no known nests there. The bald eagle is no longer listed as threatened. The final rule for delisting was published in the Federal Register on July 9, 2007. While no longer protected by the Endangered Species Act, the bald eagle continues to be managed under two federal laws: the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. As a result, seasonal closures to protect eagles at the park, and the subsequent impact analysis to bald eagles are discussed further below.

The brown pelican (*Pelecanus occidental*) is a year-round resident of the Mississippi District in the National Seashore. The brown pelican was recently delisted, but it continues to be monitored. It is a state-endangered, critically imperiled (nonbreeding) species in Mississippi (NPS 2014a).

In the Mississippi District of the National Seashore, the brown pelican inhabits the Davis Bayou Area, East Ship and West Ship islands, Horn Island, Petit Bois Island, and Cat Island. The brown pelican feeds primarily in shallow waters within 20 miles of the shoreline, rests during the day, roosts at night on sand spits and offshore sandbars, and nests on small coastal islands that provide protection from mammal predators and have sufficient elevation to prevent flooding the nests (NPS 2014a).

Although the population of American alligator (*Alligator mississippiensis*) is considered fully recovered from its federal listing as an endangered species, it remains on the threatened species list due to its similarity of appearance with the endangered crocodile; its official listing status is "Threatened (Similarity of Appearance)." Because of its similarity in appearance to the crocodile, the U.S. Fish and Wildlife Service regulates the hunting and legal trade of alligator skins and products (NPS 2014a). Alligators inhabit the wetland areas within the study corridor, especially those areas along near Stark Bayou at the Robert McGhee Road crossing.

Marine mammals are not found in the project area due to the shallowness of the water.

Other Special Status Species

Mississippi maintains a list of protected species of state concern. The saltmarsh topminnow is described below as it is found within the waters of the Davis Bayou Area. Also included are species of concern to the U.S. Fish and Wildlife Service and National Marine Fisheries Service, and those listed by the U.S. Fish and Wildlife Service as Birds of Conservation Concern, but are not federally listed species to which Section 7 of the Endangered Species Act applies. These species, termed "consideration encouraged" or "species of concern" are recommended for consideration by federal agencies undertaking management actions. They are not species officially designated as candidate species for ESA Section 7 protection.

The saltmarsh topminnow is a small fish native to the north-central coast of the Gulf of Mexico of the southern United States, from Galveston Bay, Texas, eastward through Louisiana, Mississippi, Alabama, and parts of western Florida. It is a federal species of concern managed by the National Marine Fisheries Service. Because the saltmarsh topminnow lives in salt marshes and brackish water, coastal erosion and conversion of marshes to deeper, open water eliminates the marsh surface that, when flooded, provides important foraging, shelter, and possible breeding areas for saltmarsh topminnows. The saltmarsh topminnow is believed to live in the Pensacola Bay system (NMFS 2003) and is also likely to occupy the wetlands and marshes of the Mississippi barrier islands. However, presence of this species in the Davis Bayou Area is unknown.

The Mississippi diamondback terrapin (*Malaclemys terrapin pileata*) is a medium-sized brackish-water turtle. The Mississippi diamondback terrapin is found from the Florida Panhandle to eastern Louisiana. A resident of coastal salt marshes, estuaries, and tidal creeks, it is restricted to the Gulf Barrier Islands and Coastal Marshes ecoregion. In Mississippi, terrapins typically build nests above the high tide mark on beaches backed by marshes. The marsh provides habitat for hatchlings. Nesting beaches may range from "pocket" beaches several yards long to more extensive beaches several hundred yards long. In Mississippi, terrapins are designated as a non-game species in need of management, are ranked as an S2 species, and are monitored as a species of special concern (Gulf Coast Research Laboratory 2007). The presence of this terrapin within the Davis Bayou Area was confirmed by NPS biologist in 2014.

Bald and Golden Eagles, Migratory Birds, and Other Birds of Conservation Concern

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) of 1940 (BGEPA) prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. BGEPA provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." Golden eagles are not present along the Gulf Coast. Bald eagles have been sighted in the Davis Bayou Area but are not known to nest there.

The Trustees have reviewed the project site and determined that migratory bird nesting is not known or likely, but is possible. The Migratory Bird Treaty Act (MBTA) requires the protection of all migratory bird species and protection of ecosystems of special importance to migratory birds against detrimental alteration, pollution, and other environmental degradation. Coordination under MBTA is ongoing between the Trustees and the U.S. Fish and Wildlife Service.

Migratory birds anticipated in the project area include the following:

- Raptors, including: osprey, hawks, American kestrel, bald eagle, and kites;
- Seabirds and shorebirds, including: plovers, black skimmer, sandpipers, the gull-billed tern, and the least tern;
- Wading birds, including: herons, egrets, American oystercatcher, American bittern, least bittern, lesser yellowlegs, long-billed curlew, and yellow rail;
- Waterfowl, including: geese, swans, ducks, loons, and grebes;
- Songbirds, including: warblers, sparrows, wrens, blackbirds, thrush, woodpeckers, and doves.

NPS staff implement seasonal closures to protect nesting osprey (*Pandion haliaetus*) and bald eagles (*Haliaeetus leucocephalus*) from visitor disturbance. These closures are necessary to protect osprey and bald eagle adults, eggs, and juveniles. These birds are subject to human disturbance, which can cause the adults to leave the nests and chicks to die from overheating and dehydration. From March 1 through July 31, areas within 300 yards of each osprey nest that contains adult or juvenile osprey are closed to all public use. These closures usually occur on the barrier islands, but could also occur along the coastline in the Davis Bayou Area (NPS 2014a).

The 1988 amendment to the Fish and Wildlife Conservation Act mandates the U.S. Fish and Wildlife Service to “identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973”. Birds of Conservation Concern 2008 is the most recent effort to carry out this mandate. Birds of Conservation Concern include:

- nongame birds;
- gamebirds without hunting seasons;
- subsistence-hunted nongame birds in Alaska; and
- Endangered Species Act candidate, proposed, and recently delisted species.

According to the U.S. Fish and Wildlife Service and positive sightings posted on ebird.org , 27 bird species of conservation concern have ranges that include the Davis Bayou Area of Gulf Islands National Seashore (USFWS 2015).

7.2.6.3 Human Uses and Socioeconomics

7.2.6.3.1 Socioeconomics and Environmental Justice

The Mississippi portion of Gulf Islands National Seashore is located in Jackson County, Mississippi and is recognized as a major contributor to the state's recreation and tourism industry. In 2013, the Mississippi portion of Gulf Islands National Seashore had approximately 1 million visitors who spent nearly $39 million near the park supporting 514 jobs in the local area (NPS 2014b). Visitor spending supports jobs predominantly in the services sector, including restaurants, grocery and convenience stores, hotels, and recreational businesses.

According to the U.S. Census Bureau, Jackson County's minority and low-income population were similar to the national average and lower than the state average as shown on Table 7-6.

Table 7-6. Minority and Low Income Populations Jackson County, Mississippi, and U.S. Averages, 2009-2013

LOCATION	MINORITY (PERCENT)	INDIVIDUALS BELOW THE POVERTY LEVEL (PERCENT)
Jackson County	26.9	15.9
Mississippi	40.5	22.7
United States	26.0	15.4
Source: U.S. Census Bureau American Community Survey, 2009-2013.		

Residents within the surrounding communities of the park are not disproportionately minority or low-income.

7.2.6.3.2 Cultural Resources

Cultural resources include historic properties listed in, or eligible for listing in the National Register of Historic Places (36 C.F.R. §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]." The definition of historic properties also includes significant traditional religious and cultural properties important to Indian tribes. Historic properties include built resources (bridges, buildings, piers, etc.), archaeological 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 include submerged resources.

The National Historic Preservation Act of 1966 (NHPA) charges the federal government with protecting the cultural heritage and resources of the nation. A complete review of this project under Section 106 of the NHPA would be completed as environmental review continues. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. As part of the Section 106 process, any necessary surveys or field studies would be conducted to document resources, develop avoidance procedures, and/or implement mitigation measures for the project.

The current span of known human occupation within the areas of the National Seashore extends from the Woodland Period (starting approximately 2000 years ago) to 1971, when Gulf Islands National Seashore was created. Most prehistoric archeological sites within the boundaries of the national seashore in both the Florida and Mississippi districts have been identified as Woodland or Mississippian period midden sites. European settlements in the Florida District area started around 1559. European settlements around the MS District area started around 1699. Both districts have had a large military presence since historic contact, have been used as state parks and/or resorts, or have been settled by private citizens. In addition to artifacts from these prehistoric eras, historic archeological resources from French and Spanish occupations may also be found within the National Seashore. Finally, the forts found within Gulf Islands National Seashore constitute the most notable historic structures in the area, spanning almost 150 years from the Spanish colonial to World War Two eras (NPS 2014a).

Archeological surveys were conducted in 2011 and 2014 in association with the proposed project. These surveys complemented a previous 1982 survey. Together, the surveys indicate the presence of four archeological sites within or overlapping the project study area. Although these sites have not been evaluated for NRHP eligibility, the National Park Service will formally determine their status during further field evaluation in late 2015 or early 2016. Furthermore, the 2014 survey revealed a low probability of the presence of unknown resources in the project area. Consultation with the Mississippi State Historic Preservation Officer (SHPO) is ongoing in regard to determining NRHP eligibility for the four sites. For the purposes of this EA, the sites will be treated as NRHP-eligible until the National Park Service formally determines their status and subsequently receives concurrence thereof from the Mississippi SHPO. Otherwise, the project study area contains no additional known cultural resources currently listed in or determined eligible for listing on the National Register of Historic Places (NRHP).

7.2.6.3.3 Infrastructure

Infrastructure for the purpose of this analysis includes both roadways and utility networks.

Roadways

Park Road, also known as Route 15, is a two-lane paved undivided roadway 2.17 miles long. It is the main access to the Davis Bayou Area from the U.S. 90 highway and provides access to a variety of users, park visitors, residents, and school buses. It, along with Robert McGhee Road, is the main access to the Davis Bayou Area campground, William M. Colmer Visitor Center, and boat ramp. Additionally, Park Road serves as the only access route to several residential areas near the park and is the primary access

to the Gulf Coast Research Laboratory Cedar Point Campus. Along its alignment, it has six intersections with the following access roads:

- VFW Road- connects park road with adjacent community via Knapp Road and Government Street;
- Laurel Oak Drive – University of Southern Mississippi Gulf Coast Research Laboratory (GCRL) Cedar Point Campus entrance;
- Gollott Avenue- Residential and GCRL access;
- Quave Road – Residential access;
- Robert McGhee Road- Campground access;
- Eagle Point Road- Residential access.

Park Road has 11-ft lane widths, minimum to no shoulders, and a curvilinear alignment. The posted speed limit is 35 mph north of VFW Road, 25 mph from VFW Road to Eagle Point Road, and 15 mph as vehicles approach the visitor center. It is continuously striped for no passing with double yellow centerline and white edge lines. There is little turf shoulder throughout its entire length. Additional attributes along Park Road include a special "Share the Road" sign with pedestrian and bicycle symbols advising motorists to share the road with the other transportation modes, wildlife crossings warning signs, and timber guardrails in several locations (USDOT FHWA EFLHD 2014).

Robert McGhee Road, also known as Route 16, is a two-lane paved undivided roadway 0.82 miles long. It provides access to the Davis Bayou Area Campground from Park Road. The posted speed limit for this road is 25 mph and changes to 15 mph near the Gator Pond and Nature's Way Trail entrance area. There is a "congested area" warning sign on top of the speed limit sign where this change occurs. The road is continuously striped for no passing with double yellow centerline and white edge lines. This road has little grass/ turf shoulder throughout its entire length. Additional attributes along Robert McGhee Road include a special "Share the Road" sign with pedestrian and bicycle symbols advising motorists to share the road with the other transportation modes and a pull off area at the intersection of the Nature's Way Trail and Gator Pond area. Some locations along Robert McGhee Road exhibit pavement edge drop offs higher than two inches. Such drop-offs are linked to serious crashes, including fatal collisions (USDOT FHWA EFLHD 2014), though none have yet occurred in the park.

The Davis Bayou Area trail goes along the right side of Robert McGhee Road, and Robert McGhee Road is part of the Live Oak Bicycle Route. The Davis Bayou Area trail is a 1-mile trail from the William M. Colmer Visitor Center to the picnic area. This trail provides a connecting link with the Nature's Way Trail and the CCC trail. It is an approximate 3-ft wide gravel trail for pedestrian use only. The 15-mile Live Oak Bicycle Route, two miles of which are in the park, connects the Davis Bayou Area with the town of Ocean Springs, Mississippi. There are no sidewalks or bicycle lanes within the Davis Bayou Area; however, a series of pedestrian trails connect the William M. Colmer Visitor Center to different observation areas: Davis Bayou Trail, CCC Spur Trail, Nature's Way Loop Trail, and Visitor Center Trails.

At the intersection of Knapp Road and VFW Road, where Alternative C would be implemented, the two roads are small, narrow two-lane roads. There are no sidewalks or walking trails present in this area, and the roads have little grass/ turf shoulder.

Public Utilities

Various utilities are located along the road corridors within the Davis Bayou Area. These include electric, water, sewer, cable, and phone lines. Electrical lines are located on the east side of Park Road between Knapp Road and the William M. Colmer Visitor Center. Water and sewer lines run beneath Park Road and buried cable and phone lines are located on the west side of Park Road. Some utility lines are also present within the Robert McGhee Road corridor (Figure 7-8). Fiber optic lines are not currently present, though the park anticipates they will be installed in the future. The electrical company has mentioned upgrading the lines that run through the park. Any such upgrade would be done in conjunction with park planning efforts. Both the fiber optic and electric lines would be buried.



Figure 7-8: Project Area Utilities Map
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service

Note: Utility data not complete and should not be used as survey grade utility data.

7.2.6.3.4 Land and Marine Management

The project area within the Davis Bayou Area of Gulf Islands National Seashore is devoid of commercial or private development and consists of the Park Road and Robert McGhee Road corridors. While there are a few residential and academic areas interspersed along the Park Road corridor the project area is largely bordered by U.S. Route 90 to the north, residential development to the east and west, and Davis Bayou and the Gulf of Mexico to the south. The proposed project is consistent with the Gulf Islands National Seashore General Management Plan completed in 2014 (NPS 2014a). The proposed project area is currently used as an access route and for recreational activities and is managed by the National Park Service. The area is currently zoned for diverse visitor opportunities, and land use and management authority at the Davis Bayou Area is under the purview of the National Park Service.

Under the Coastal Zone Management Act of 1972, proposed actions must be consistent to the maximum extent practicable with the federally approved coastal management programs for states where the activities would affect a coastal use or resource. Before project implementation, a consistency determination would be submitted for state review and concurrence. Federal Trustees are submitting consistency determinations for state review coincident with public review of this document.

7.2.6.3.5 Aesthetics and Visual Resources

The project area primarily consists of a two-lane, asphalt roadway. The road corridors were designed with winding curves to provide visitors with glimpses of open vistas and a scenic approach through the national park and to the William M. Colmer Visitor Center. As one travels the length of the corridor, the road is bounded by a closed canopy of mixed pine and hardwood species, a relatively diverse assemblage of shrubs and saplings, wetlands, and some pedestrian walkways. This canopy is enjoyed by motorists and pedestrians. The topography of the area is flat to very gently sloping. Vehicular traffic, pedestrians, bicyclists, and the roadway itself detract somewhat from the natural landscape and soundscape within the project area.

7.2.6.3.6 Tourism and Recreational Use

Tourism / Visitation

Gulf Islands National Seashore is the largest seashore in the national park system. The park provides the public with access to barrier islands, historic coastal fortifications, a bayou, and recreational opportunities from Florida to Mississippi. The waters, beaches, fertile coastal marshes, forests, submerged lands, and wildlife in the National Seashore provide a stark contrast to the rapidly growing coastal communities and major population centers along the northern Gulf of Mexico coastline. The National Seashore is the most heavily visited seashore and one of the 10 most visited park units in the national park system. Most visitors to the National Seashore come from within a 500-mile radius, including the states of Georgia, Alabama, Florida, Mississippi, Tennessee, Louisiana, Texas, and Arkansas.

Changes in annual visitation and visitation patterns to the National Seashore are influenced by hurricanes and other strong coastal storms. Hurricanes can close bridges and destroy piers, beaches,

and visitor facilities. The National Seashore was impacted by several hurricanes over the years, including Hurricane Opal in 1995; four hurricanes and two tropical storms in 2004; Hurricanes Katrina and Dennis in 2005; and Hurricane Isaac in 2012. Following the storms in 2004, visitation numbers were lower for four years in a row. For the period between 2010 and 2014, the average visitation to the National Seashore was 4.8 million visitors (NPS 2015).

Although the National Seashore is open year-round, the highest visitor use occurs from May through August (nearly 50% of annual recreation visits). June and July generally receive the highest levels of visitation, while December and January generally have the lowest visitation. On average, the Florida District receives about 75% of the recreation visitors, although visitation fluctuates from year to year (NPS 2014a). Between 2010 and 2013, the Davis Bayou Area averaged about 1 million annual visitors (NPS 2014b).

Recreational Use

Within the Davis Bayou Area, visitors have access to the William M. Colmer Visitor Center to learn about the historic and natural resources and recreational opportunities available at this portion of Gulf Islands National Seashore. Recreational fishing occurs in the Davis Bayou Area and the rebuilt fishing pier near the visitor center is open to the public. Camping is available year-round at the Davis Bayou Area Campground (a 51-site campground). Between 2010-2013, there was an average of 26,500 overnight stays at the campground. The National Seashore also has a small boat launch and formal picnicking opportunities in the Davis Bayou Area.

Over the course of the past 20 years, about 10,000 additional residents have moved into Ocean Springs, mostly in areas east of the Davis Bayou Area and accessible from Park Road. Park Road serves as the only access route to several residential areas near the park, is the primary access to the Gulf Coast Research Laboratory Cedar Point Campus, and provides an overpass over Pabst Road and the railroad tracks. As a result, traffic on Park Road between the park entrance and VFW Road has increased significantly.

Many local residents use the Davis Bayou Area of the park, and the roads within, for walking, bicycling, and commuter traffic routes. Without a consistent shoulder, all of these user groups share the use of the road surface within the park. A safety study of the park completed in 2014 by the U.S. Department of Transportation Federal Highway Administration Eastern Federal Lands Highway Division, reported that the peak use times for pedestrians and bicyclists are between 4:00 pm and 6:00 pm on weekdays and between 10:00 am and 12:00 pm on weekends with as many as 140 pedestrians and bicyclists using the roads at one time. The weekday peak bicycle hours coincide with peak vehicular times for those area residents who use the park roads to commute home after work (USDOT FHWA EFLHD 2014).

There are five trails that are part of the recreational and educational opportunities in the Area. The Davis Bayou Area Visitor Center Trail provides visitors with terrific views of Davis Bayou and ends at an overlook on the shore of the Mississippi Sound. The Nature's Way Trail is a short loop interpretive trail that traverses a maritime forest, an ancient dune system, and an adjacent salt marsh. Connecting the Davis Bayou Area with the town of Ocean Springs, Mississippi, is the 15-mile Live Oak Bicycle Route, two miles of which are within the park. A short Civilian Conservation Corps (CCC) trail follows along a

former CCC roadbed, which leads to an overlook of the salt marsh and CCC-built features. The Davis Bayou Area Trail is a 1-mile trail from the William M. Colmer Visitor Center to the picnic area. This trail provides a connecting link with the Nature's Way Trail and the CCC trail.

Climate Change

Climate change may affect visitor experience at the National Seashore, ranging from altered timing of visitation to restrictions on public access. Longer, hotter summers may shift the spring and fall visitation seasons, and visitation may decline during the hottest summer months or during months with increased storms. Visitor facilities, such as campgrounds or picnic shelters, may need to be upgraded or moved to be more resilient to severe weather like flooding or hurricanes. Energy expenditure for cooling buildings may increase in the summer and decline in the winter. Pollen-based allergies and outbreaks of mosquito-borne diseases may also increase. Visitation for birding and fishing may change if new species from the south shift northward into the National Seashore or if extant species move northward or have dramatic declines in population. Sea level rise and erosion, or the need to protect certain areas, may alter visitor access to certain parts of the National Seashore such as fortifications and marsh areas.

7.2.6.3.7 Public Health and Safety and Shoreline Protection

Many local residents use the Davis Bayou Area of the park, and the roads within, for walking, bicycling, and commuter traffic routes. Without a consistent shoulder, all of these user groups share the use of the road surface within the park. Additional residential development is expected in the areas surrounding the Davis Bayou Area in the near future. Additionally, the Gulf Coast Research Laboratory has plans to extend their public services in the near future. Both of these factors will likely increase vehicular traffic on Park Road.

A safety study of the park completed in 2014 by the U.S. Department of Transportation Federal Highway Administration Eastern Federal Lands Highway Division identified speeding as being a significant safety problem in the Davis Bayou Area. According to the park's law enforcement officers, in 2010 and 2011, there were over 200 warnings issued for minor (5-10mph) speeding violations each year respectively. In 2010, over 50% of all speeding tickets issued in the Davis Bayou Area were for between 16-20 mph over the 25MPH speed limit on Robert McGhee Road or the 35 MPH speed limit on Park Road. Just fewer than 25% were between 21-25 mph over the speed limit. Speed is a contributing factor for 46% of all crashes in the park between 2011 and 2014. Between 2009 and 2014, National Park Service enforcement in the Davis Bayou Area issued 78 speeding tickets, 25 driving while suspended violations, 14 driving while under the influence operations, and 11 unsafe operations (USDOT FHWA EFLHD 2014).

While no pedestrian-related crash was reported within this unit of the park, near misses were observed numerous times by NPS law enforcement personnel and visitors. The high volume of pedestrian and bicycle activity on the park roads, combined with vehicular speeding issues on Park Road, represent a safety risk for these users.

As stated in the American Association of State Highway and Transportation Officials *Guide for the Development of Bicycle Facilities*, road width is the most critical design element affecting the ability of a roadway to accommodate bicycle traffic. The roadway should provide sufficient paved width to

accommodate both motorized and non-motorized traffic without compromising the level of service and safety for either user (AASHTO 1999). Park and Robert McGhee Roads each have 11-ft lane widths, minimum to no shoulders, and curvilinear alignments. Current configuration of the roads, with the mixture of uses, leaves virtually no space on the road surface for pedestrians and bicyclists when two vehicles in opposing lanes meet each other, thus creating a dangerous situation.

The safety study identified the peak weekday pedestrian and bicyclist use period within the park between 4:00 PM to 6:00 PM. On weekends, pedestrian peak activity is higher between 8:00 – 10:00AM and for bicyclists peak activity occurs between 10:00-11:00 AM (USDOT FHWA EFLHD 2014). The weekday peak pedestrian and bicyclist use time period coincides with high vehicular use of Park Road during the evening workday commute.

No hazardous materials currently exist at the project site where the potential for human exposure presents a substantial risk. The Davis Bayou Area is situated along an area of stable coastline not prone to significant shoreline erosion under normal conditions. Other natural hazards do not occur in any great abundance within the boundaries of the Davis Bayou Area of Gulf Islands National Seashore.

7.2.7 Environmental Consequences

Under the NEPA, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the environmental consequences of the project.

In order to determine whether an action has the potential to result in significant impacts, the **context and intensity** of the action must be considered. **Context** refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). **Intensity** refers to the severity of impact and could include the timing of the action (e.g., more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse.

For purposes of this document, impacts are characterized as minor, moderate or major, and temporary or long-term. The analysis of beneficial impacts focuses on the duration (short- or long-term), without attempting to specify the intensity of the benefit. The definition of these characterizations is consistent with that used in the Phase III ERP/PEIS, and can be found in Table 6-2, of Section 6.1 of that document, and in Appendix D of this document.

The programmatic analysis looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project.

7.2.8 Environmental Consequences of Alternative A: No-Action Alternative

Both the Oil Pollution Act and National Environmental Policy Act require consideration of the No-Action Alternative. For this Draft Phase III ERP proposed project, the No-Action Alternative assumes the Trustees would not pursue this project as part of Phase IV Early Restoration.

Under this alternative, Park Road and Robert McGhee Road would continue to be used for both vehicular and recreational purposes. Motorists, pedestrians, and bicyclists would continue to use the same pavement surface, with limited space for either user group to maneuver around the other. No additional safety precautions to be constructed or implemented are proposed. Existing trails within the National Seashore (CCC Spur Trail, Nature's Way Trail, and the Davis Bayou Trail) would remain in use along their current routes. There would be no restrictions on traffic flow on VFW Road.

7.2.8.1 Physical Environment

7.2.8.1.1 Geology and Substrates

Under the No-Action Alternative, there would be no fundamental change to geology and substrates. There is no shoulder on the roadways, so vehicles and recreational users have to share the roadways. During times where there is heavy use by both vehicles and recreational users, visitors would continue to walk and/or cycle off the roadways. These activities exacerbate erosion and compaction of soils along the roadways causing minor, adverse impacts to soil. Debris and foreign material from the roadways would continue to be integrated into the natural soil regimen.

7.2.8.1.2 Hydrology, Water Quality, and Floodplains

There would be no impacts to the hydrology, water quality, or floodplains under the No-Action Alternative beyond the present baseline conditions because there would be no new construction-related actions and no changes made within the study area.

7.2.8.1.3 Air Quality and Greenhouse Gas Emissions

Under the No-Action Alternative, it is assumed the level of use by motor vehicles in the Davis Bayou Area of the park would increase slightly over time as housing developments in the area increase. A small increase in air emissions is permissible under the qualifications of a Class II airshed and this slight increase would not affect the area's attainment for all criteria pollutants. Impacts would be minor, adverse, and long-term.

The continued use of gasoline and diesel-powered vehicles, including cars and trucks would continue to contribute to GHG emissions and result in long-term adverse impacts. However, it is not anticipated that emissions from an increase in traffic through the park would exceed the 25,000 metric tons per year threshold established by CEQ as a level above which a detailed analysis of emissions would be required. Impacts would be minor, adverse, and long-term.

7.2.8.1.4 Noise

Under Alternative A, it is assumed that the level of use by motor vehicles in the Davis Bayou Area of the park would increase slightly over time as housing development in the area increased. This increase in vehicular traffic within the area could contribute minor, long-term impacts to the natural soundscape depending on the time of day, the time of year, and the level of congestion within the Davis Bayou Area.

7.2.8.1.5 Summary of Impacts to the Physical Environment

Impacts to the physical environment under Alternative A would include:

- Adverse impacts to soil would be minor from the continued erosion and compaction of soils resulting from visitors walking and/or cycling off the roadways during times of heavy use;
- There would be no impacts to the hydrology, water quality, or floodplains under because there would be no new construction-related actions and no changes made within the study area;
- Long-term impacts to air quality and green house gas emissions would be minor and adverse from the continued and assumed slight increase in gasoline and diesel-powered vehicle use in the Davis Bayou Area;
- Long-term impacts to the natural soundscape could be minor from an increase in vehicular traffic in the Davis Bayou Area depending on the time of day, time of year, and level of congestion.

7.2.8.2 Biological Environment

7.2.8.2.1 Living Coastal and Marine Resources

Wetlands

Under the No-Action Alternative, there would be no new construction-related activity and no changes made to existing conditions within the study area. Continued use of the park roads by pedestrians, bicyclists, and motor vehicles would contribute minor, long-term adverse impacts to the living coastal and marine resources as a result of runoff into wetlands and other water bodies from minor spills of automotive fluids; stormwater runoff from existing roadways into wetlands and other water bodies; and disturbance resulting from the presence of people.

Emergent and Terrestrial Habitat

Under the No-Action Alternative, there would be no new construction-related activity and no changes made to existing conditions within the study area. Continued use of the park roads by pedestrians, bicyclists, and motor vehicles would contribute minor, long-term adverse impacts to the living coastal and marine resources as a result of runoff into emergent habitats from minor spills of automotive fluids; stormwater runoff from existing roadways into wetlands and other water bodies; and disturbance resulting from the presence of people.

Wildlife and Wildlife Habitat

Under the No-Action Alternative, there would be no new construction-related activity and no changes made to existing conditions within the study area. Continued use of the park roads by pedestrians, bicyclists, and motor vehicles would contribute minor, long-term adverse impacts to the living coastal and marine resources as a result of potential collisions with wildlife; the potential for runoff into wetlands and other water bodies from minor spills of automotive fluids; stormwater runoff from existing roadways into wetlands and other water bodies; and disturbance resulting from the presence of people.

Fish and Fish Habitat

Under the No-Action Alternative, there would be no new construction-related activity and no changes made to existing conditions within the study area. Continued use of the park roads by pedestrians, bicyclists, and motor vehicles would contribute minor, long-term adverse impacts to the living coastal and marine resources as a result of runoff into wetlands and other water bodies from minor spills of automotive fluids; stormwater runoff from existing roadways into wetlands and other water bodies; and disturbance resulting from the presence of people.

Essential Fish Habitat

The impacts to EFH would be similar to those stated above for "Fish and Fish Habitat."

7.2.8.2.2 Protected Species

Federally Listed Threatened and Endangered Species

There would be no impacts to federally listed species under the No Action Alternative because the only federally listed species that is known to occur in the project corridor is the American alligator. The alligator is considered fully recovered from its listing as an endangered species and only remains on the threatened species list due to its similarity of appearance with the endangered crocodile. The U.S. Fish and Wildlife Service regulates the hunting and legal trade of alligator skins and products, but it no longer considers alligator populations to be imperiled (NPS 2014a).

Other Special Status Species

Under the No-Action Alternative, there would be no new construction-related actions and no changes made within the study area. Motor vehicles would be expected to continue exceeding the speed limits within the park thereby increasing the potential for collisions with wildlife. Continued use of the park roads by pedestrians, bicyclists, and motor vehicles would contribute minor, long-term adverse impacts to some of the special status species within the park because of potential collisions with wildlife, the potential for runoff into wetlands and other water bodies from minor spills of automotive fluids, and disturbance resulting from the presence of people.

Bald and Golden Eagles, Migratory Birds, and Other Birds of Conservation Concern

Under the No-Action Alternative, there would be no new construction-related actions and no changes made within the study area. Continued use of the park roads by pedestrians, bicyclists, and motor vehicles could contribute minor, long-term adverse impacts to bald and golden eagles, migratory birds, and other birds of conservation within the park as a result of potential collisions, the potential for runoff into wetlands and other water bodies from minor spills of automotive fluids, and disturbance resulting from the presence of people.

7.2.8.2.3 Summary of Impacts to the Biological Environment

Impacts to the biological environment under Alternative A would include:

- Impacts to living coastal and marine resources would be minor, adverse and long-term from the runoff from minor spills of automotive fluids and stormwater, and disturbance from the continued use of the park roads by pedestrians, bicyclists, and motor vehicles;
- There would be no impact to federally listed threatened and endangered species. Impacts to other special status species, bald and golden eagles, migratory birds, and other birds of conservation would be minor, adverse and long-term from the continued potential for the following: collisions, runoff into wetland and other water bodies from minor spills, and disturbance from people.

7.2.8.3 Human Uses and Socioeconomics

7.2.8.3.1 Socioeconomics and Environmental Justice

There would be no ground disturbance under the No-Action Alternative. As such, there would be no impacts to cultural resources as a result of implementation of Alternative A.

7.2.8.3.2 Cultural Resources

There would be no disturbances to either archeological resources or historic structures under the No-Action Alternative. As such, there would be no impacts to cultural resources because of implementation of Alternative A.

7.2.8.3.3 Infrastructure

Under the No-Action Alternative, there would be no changes to infrastructure or additional public utility requirements. Park Road and Robert McGhee Road would remain at their current width (22 ft) with no shoulder. Through traffic on Park Road would remain high or would likely continue to increase. Roads in the park would continue to be used by pedestrians, bicyclists, and motor vehicles. Park Road would continue to serve as the principal access for private subdivisions and the University of Southern Mississippi Gulf Coast Research Lab off Eagle Point, Gollott, Quave, and Laurel Oak Roads. Commuter traffic would continue on Park Road connecting to the local community road network via VFW Road. Impacts to the public utilities from their continued use would be minor. Impacts to the park roadways would be long-term, minor, and adverse depending on the amount of through traffic using the park roads, time of day, and the number of user groups sharing the roadways.

7.2.8.3.4 Land and Marine Management

Under the No-Action Alternative, no changes would occur to the current land use at the project site or the adjoining shoreline areas. The area would remain zoned for diverse visitor opportunities and land use and management authority at the Davis Bayou Area would remain under the purview of the

National Park Service. Thus, no impacts would occur to land and marine management under Alternative A.

7.2.8.3.5 Aesthetics and Visual Resources

Under the No-Action Alternative, the road corridor would remain in its current condition. The presence of vehicular traffic, pedestrians, bicyclists, and the roadway itself would continue to detract somewhat from the natural landscape and soundscape within the project area. Use of the northern portion of Park Road as a throughway for commuter traffic would continue to increase the amount of vehicles along this portion of road in comparison to the remainder of the park. During times of heavy traffic, this increased presence of vehicles would result in a long-term, minor adverse impact to the aesthetics and visual resources within this portion of the park.

7.2.8.3.6 Tourism and Recreational Use

There would be no change in the fundamental nature and quality of the tourism or recreational use of the Davis Bayou Area under the No-Action Alternative. Roads would remain accessible and in their current condition and traffic patterns would remain consistent, although traffic volume would be expected to increase. Visitors and local residents would continue to have access to the roads and the areas and resources they service. Bicyclists and pedestrians would continue to traverse Robert McGhee Road and Park Road for recreational purposes and pedestrians, bicyclists, and motorists would continue to share the road surface at all times. Existing trails within the National Seashore would remain in use along their current routes.

There would be adverse impacts to tourism and recreational use depending on the time of day, location within the park, and level of congestion between the various user groups. Minor adverse impacts to recreational users on foot or bicycle would result from increased risks associated with sharing the road with vehicular traffic, impacts to the viewshed and natural soundscape resulting from traffic, and insecurity resulting from the proximity of vehicular traffic. With the potential for traffic in the park to increase, conditions could deteriorate to the point where the quality of the visitor experience would be diminished for visitors who favor this area. For visitors/local residents who utilize the park roads as a commuter route, adverse impacts would result from the need to reduce driving speeds during heavy bicycle-pedestrian congestion and the increased risk associated with passing these user groups on the roads' many curves.

Adverse impacts on tourism and recreational use under the No-Action Alternative would be long-term, and could range from minor to moderate, depending on the time of day, level of congestion, and the potential for increased park traffic volume in the future.

7.2.8.3.7 Public Health and Safety and Shoreline Protection

Under the No-Action Alternative, visitors and local residents would continue to have access to the roads and the areas and resources they service. Bicyclists and pedestrians would continue to traverse Robert McGhee Road and Park Road for recreational purposes and pedestrians, bicyclists, and motorists would continue to share the road surface at all times. There would be adverse impacts to public health and

safety depending on the time of day, location within the park, and level of congestion between the various user groups. Minor to moderate adverse impacts to public health and safety would result from increased risks associated with pedestrians sharing the road with vehicular traffic.

The speed limit on Park Road would remain at 35 miles per hour and it is anticipated that vehicle speed would continue to be a safety concern and could possibly worsen with the potential for traffic in the park to increase with expected future development in the surrounding areas. For visitors/local residents who utilize the park roads as a commuter route, minor to moderate adverse impacts to public health and safety would result during heavy bicycle-pedestrian congestion and the increased risk associated with passing these user groups on the roads' many curves.

7.2.8.3.8 Summary of Impacts to the Human Uses and Socioeconomics

Impacts to the human uses and socioeconomics from Alternative A would include:

- There would be no impacts to socioeconomics and environmental justice because there would be no actions to alter the existing socioeconomic conditions in the vicinity of the Davis Bayou Area.
- There would be no impacts to cultural resources because there would be no disturbances to either archeological resources or historic structures.
- Impacts to infrastructure from the continued use of public utilities and park roadways would be minor and adverse.
- There would be no impacts to land and marine management because there would be no changes to the current land use at the project site or the adjoining shoreline areas.
- Long-term impacts to the aesthetics and visual resources within the Davis Bayou Area would be minor and adverse from the continued presence of vehicular traffic, pedestrians, bicyclists, and the roadway itself.
- Adverse impacts to tourism and recreational use of the Davis Bayou Area would be minor to moderate depending on the mode of transportation, the time of day, level of congestion, and the potential for increased park traffic volume in the future.
- Adverse impacts to public health and safety would be minor to moderate from increased risks associated with pedestrians sharing the road with vehicular traffic. These impacts could possibly worsen with the potential for traffic in the park to increase with expected future development in the surrounding areas.

7.2.9 Environmental Consequences of Alternative B: Construct Multiple Use Lanes (Preferred Alternative)

7.2.9.1 Physical Environment

7.2.9.1.1 Geology and Substrates

Sections 6.5.1.1 and 6.7.1.2 of the Final Phase III ERP PEIS describe the impacts to geology and substrates from early restoration projects intended to enhance public access to natural resources for

recreational use. Section 6.5.1.1 states that these types of projects… "Could require work with heavy equipment in construction or staging areas that would temporarily disturb soils and sediments in upland, shallow water areas or nearshore habitats. These construction activities could result in the local removal, compaction, and erosion of upland, shallow-water, and nearshore substrates in construction/development areas. These would be minor to moderate short- to long-term adverse effects because they would be localized and could have readily apparent effects on local soils, substrates and/or geologic features, with some effects lasting only during the construction period (heavy equipment use) and others extending beyond the construction period (compaction and displacement resulting from infrastructure)".

For this project type, impacts to geology and substrates were analyzed adequately within the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative B, anticipated activities during construction of the multiple use lanes that may impact geology and substrates include ground disturbance from soil removal, grading, and vegetation clearing. Widening Park Road and Robert McGhee Road would require placement of structural fill in certain areas. Impacts from construction would be moderate, adverse, and short-term. The estimated ground disturbance area encompasses up to 14 ft of new asphalt area, 8 ft of non-paved shoulders, plus 5 ft from the toe of slopes for construction and heavy equipment maneuvering along Park Road and Robert McGhee Road.

Along the first mile of Park Road, there would be additional excavation, disturbance, and possible fill placement for the traffic-calming medians and if needed, the retaining wall. Soil would need to be removed and vegetation cleared to lay the foundation for both projects. The project may also require the extension, widening, or addition of culverts that would disrupt and displace soil. There would also be some soil disturbance around the intersection of VFW Road and Knapp Road where an automatic gate and park signs would be placed and at the intersection with Highway 90 where park signs would be relocated.

Areas disturbed during construction would have increased erosion potential especially if it requires cutting into existing slopes. Soil exposed during the clearing of vegetation would be susceptible to increased erosion until vegetation was re-established. The amount of erosion would be dependent on the amount of ground disturbance, weather, and any erosion control measures in place. Tire tracks from construction equipment would potentially erode and move soil from the project area to other locations. Heavy construction equipment would also lead to increased soil compaction in and near the project site. The degree of compaction is typically greater in soil with higher moisture content. Measures would be taken to minimize soil disturbance, transfer, and compaction from any construction equipment.

The excavated soil would be stockpiled for reuse as clean fill and would be properly stored and stabilized. Restoration and revegetation efforts would be in accordance with NPS policies. Storage would be for as short a time as possible to prevent loss of seed, root viability, and degradation of the soil microbial community.

The new road configuration would have minor, adverse, and long-term impacts to geology and substrates. The expanded roadway would increase the potential for foreign material to integrate into

the natural soil regimen. New material may not have the same consistency of the existing naturally developed soil and adversely impact natural geologic processes. The EFH mitigation project of creating one acre of marsh will require dredging sediment from approximately three acres (for a full discussion of this mitigation project and why it is needed, see the "Essential Fish Habitat" section under section 7.2.9.2.1 below). Sediment to be dredged will be below low low tide and will be unvegetated. This would cause minor to moderate long-term adverse effect to submerged geology and substrates. Over time, however, "borrow areas" are expected to fill in as benthic sediments get re-distributed during storm events and/or as suspended sediments in bayou waters settle out in these areas and natural aggradation processes occur.

Mitigation measures for impacts to geology and substrates are found on page 13 of Appendix 6A of the Final Phase III ERP/PEIS. Measures that would apply to and be implemented for the proposed Bike and Pedestrian Use Enhancements at Davis Bayou Project include:

- Employment of standard BMPs for construction to reduce erosion;
- Employment of temporary erosion controls prior to any land clearing or land disturbance on the project site, which would be monitored during construction to ensure proper function. Turbidity curtains, hay bales, and erosion mats would be used where appropriate;
- Existing access ways would be used whenever possible;
- Soil disturbance would be to the minimum area and the minimum length of time necessary to complete the action;
- Seasonal rainfall would be factored into the construction timeline to reduce ground disturbance during raining or flood seasons;
- Selection and operation of heavy equipment to minimize adverse effects to the environment (e.g., minimally sized, low-pressure tires, minimal hard turn paths for tracked vehicles, temporary mats or plates within wet areas or sensitive soils).

7.2.9.1.2 Hydrology, Water Quality, and Floodplains

Sections 6.5.1.2 and 6.7.2.2 of the Final Phase III ERP PEIS describe the impacts to Hydrology and Water Resources from early restoration projects intended to enhance public access to natural resources for recreational use. Section 6.5.1.2 states that these types of projects… "Recreational enhancement projects have the potential to have minor to moderate long-term beneficial effects on water quality depending on the proposed activity. If recreational enhancements occurred at an existing site where ongoing degradation is occurring (e.g. unimproved or failing parking areas with poor stormwater management near coastal waters), there could be long-term benefits to water quality. Equipment usage and other construction activities in wetland recharge areas could result in short-term minor to moderate adverse impacts to surface water related to sediment compaction, disturbance, and erosion. Conversion of natural areas to impervious surfaces could increase, which could increase stormwater runoff and pollutants to the receiving water body and cause minor long-term adverse effects. Long-term decreases in surface water quality could occur from increased use and presence of equipment within the project area, which would be minor and long-term because the effects would be localized and would extend beyond the construction period. Equipment usage and other construction activities in wetland recharge

areas could result in short-term adverse impacts to surface water related to sediment compaction, disturbance, and erosion."

For this project type, impacts to hydrology, water quality, and floodplains were analyzed adequately within the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under alternative B, impacts to hydrology, water quality, and floodplains would be associated with construction and mitigation activities. Best management practices and mitigation measures that would be applied are identified below.

Impacts to surface hydrology under Alternative B would be site-specific and limited to areas where wetland hydrology would be altered and where marsh creation would occur associated with mitigation of impacts to EFH. Impacts to hydrology would be moderate since they would be permanent. However, these impacts would occur over a very small area relative to the total hydrological resources in Davis Bayou Area. Additionally, impacts to hydrology in the marsh in east Stark Bayou would be long-term beneficial due to the new larger culvert that will be installed in Park Road.

The addition of additional culverts to the East Stark Bayou crossing on Park Road would increase tidal flow to and from the areas upstream of the crossing. Some of the wetlands in the study area exist because the ground water elevations are high (e.g., wet pine savannah). Though construction in these areas may reach groundwater due to the existing high water table indicative of the gulf coast area, it is not likely to impact groundwater hydrology at larger depths where aquifers are located.

Construction activities may impact surface and groundwater quality due to erosion. The release of sediments during construction would be controlled using best management practices and mitigation as described below to protect soil resources, prevent the transport of sediment into waterways, confine impacts to the construction sites, and to minimize the magnitude of the impacts on downstream water quality. Further, revegetation of disturbed sites would be started as soon as practical after work in an area was completed. A loss of up to 7.3 acres of wetlands may lead to a loss of water quality functions such as groundwater discharge/recharge, sediment/toxicant retention, and nutrient removal. However, depending on the acreage of wetlands surrounding the filled areas, minor long-term adverse impacts could occur but would not create a noticeable difference in water quality functions. If pilings are used to construct the trail across the estuaries on Park Road and Robert McGhee Road, sediment disturbance would increase during construction increasing the turbidity of surrounding surface water. Areas where emergent marsh would be created would experience similar minor, short-term adverse impacts to surface water quality with the addition of sediment. Long-term beneficial impacts to water quality would occur due to the filtering effects of the intertidal emergent wetlands that will be created. Because of the proven effectiveness of best management practices, discharge of sediment to waterways that would impact surface and groundwater quality would be minor and short term. Additionally, best management practices, along with other avoidance, mitigation and permit conditions required by state and federal regulatory agencies would be used to minimize water quality and sedimentation impacts. As such, impacts to surface and groundwater water quality in this area would be both short-term adverse and long-term beneficial.

Activities under Alternative B would occur in the 100-year floodplain and in Zone "X (Other Areas)," Compacting and filling up to 7.3 acres of wetlands adjacent to the existing roadway will reduce the natural features of the floodplain and could increase flooding severity since these habitats provide a valuable ecological service (e.g., water storage and storm buffering; see wetlands sections of this EA). However, due to the large acreage of wetlands surrounding the proposed fill areas, the impacts may not create a noticeable difference in the benefits to the natural function of the floodplain. Because of a) BMPs that will be implemented during construction, and b) the limited acreage of impacts to wetlands, relative to the total wetlands acreage in the Davis Bayou Area, impacts to the natural functioning of the floodplain under Alternative B would be minor.

Mitigation measures for impacts to hydrology, water quality, and floodplains are found on page 14 of Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would apply to and be implemented for the proposed project include:

- Buffers between areas of soil disturbance and wetlands or waterways would be planned and maintained as possible;
- Erosion-control practices such as sediment traps, erosion check screen filters, and hydro mulch would be used;
- Any hazardous waste that is generated in the project area would be promptly removed and properly disposed of;
- Equipment would be inspected for leaks of oil, fuels, or hydraulic fluids before and during use to prevent soil and water contamination. Contractors would be required to implement a plan to promptly clean up any leaks or spills from equipment, such as hydraulic fluid, oil, fuel, or antifreeze;
- Onsite fueling and maintenance would be minimized. If these activities could not be avoided, fuels and other fluids would be stored in a restricted/designated area, and fueling and maintenance would be performed in designated areas that are bermed and lined to contain spills. Provisions for the containment of spills and the removal and safe disposal of contaminated materials, including soil, would be required;
- Action would be consistent with state water quality standards and Clean Water Act Section 401 certification requirements;
- Slopes of newly filled areas would be vegetated and properly maintained to avoid adverse impacts on aquatic environments;
- Selection and operation of heavy equipment to minimize adverse effects to the environment (e.g., minimally-sized, low-pressure tires, minimal hard-turn paths for tracked vehicles, temporary mats or plates within wet areas or sensitive soils).

7.2.9.1.3 Air Quality and Greenhouse Gas Emissions

Sections 6.5.1.3 and 6.7.3.2 of the Final Phase III ERP/PEIS describe the impacts to air quality and greenhouse gas emissions from early restoration projects intended to enhance public access to natural resources for recreational use. Section 6.5.1.3 of the PEIS states, "During construction activities, short-term impacts to air quality and GHGs would occur from the use of gasoline and diesel powered

construction vehicles and equipment, including barges, and exhaust produced by the use of this equipment. Examples of project-specific projected emissions are located in Chapters 8 through 12. The severity of impacts would be highly dependent on the length and type of construction required and the location of the project. There is a slight potential for fugitive dust creation from construction activities, resulting in minor to moderate adverse impacts. Long-term minor adverse effects from these enhancements due to increased recreational use and associated vehicle traffic may occur."

For this project type, air quality impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative B, emissions of particulates that could affect air quality, including visibility in the general vicinity of the project areas, could temporarily increase during construction activities from the use of motorized equipment at the site and from exhaust from gasoline- or diesel-powered vehicles and equipment. This equipment would also temporarily emit air pollutants. However, activities requiring the use of machinery would not be expected to be long-term. Because of the short-term and localized nature of the operation, impacts to air quality from construction activities would be minor. The area is in attainment for all criteria pollutants and under the qualifications of a Class II airshed, small increases in air emissions are allowed. Because of the localized and short-term use of construction equipment, any emissions would not be expected to exceed the NAAQS as a result of implementation of the proposed action.

The proposed action would not have a significant impact on GHG emissions because the construction associated with the alternatives would occur over a short period of time and within an area less than two square miles and would therefore not be considered a large-scale project. Furthermore, following the construction, a large change in the number of vehicles using the Gulf Islands National Seashore roadways in the project area would not be expected. Actions proposed under Alternative B would not be anticipated to change the level of motor vehicle traffic within the park, the local area, or the region and therefore impacts to GHG emissions would be minor. In addition, with the provision of multiple use bicycle-pedestrian lane, some visitors would be more likely to travel through the park by foot or by bicycle, thereby reducing the amount of emissions in the David Bayou area.

The main purpose and need for the proposed actions under Alternative B would be to improve safety and the flow of traffic, not to alter the amount of traffic. Any potential changes in GHG emissions would be well below the CEQ screening threshold.

Available mitigation measures would be employed to reduce the release of GHG during project implementation. The following mitigation measures have been identified in the Final Phase III ERP/PEIS to reduce or eliminate GHG emissions from the construction phase of the proposed project:

- Shut down idling construction equipment, if feasible;
- Locate staging areas as close to construction site as practicable to minimize driving distances between staging areas and construction site; and
- Encourage the use of the proper size of equipment for the job to maximize energy efficiency.

7.2.9.1.4 Noise

Section 6.5.1.4 of the Final Phase III ERP/PEIS states that "During the construction period, adverse impacts to ambient noise levels could occur, particularly along shorelines where construction activities would take place. The severity of impacts would depend to a large degree on the location of the project and the amount of noise that these activities would generate and the distance to sensitive receptors such as recreational users or wildlife. Installation activities, equipment operation, and vehicle or boat traffic associated with the construction activities could result in short-term minor to major adverse impacts to noise, especially if they occurred in natural areas. For example, during the use of motorized heavy equipment such as cranes and barges, noise would be created which would be readily apparent and attract attention. Although such changes would not dominate the soundscape and some sounds could be dampened or masked by ambient wave or ship noise, these actions could detract from the current user activities or experiences and create audible contrast for visitors in the project area."

For this project type, noise impacts were analyzed adequately within the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative B, sounds from equipment and work crews would increase during construction associated with road safety improvements, the potential placement of pilings, and the creation of emergent marsh. Construction noise would not contribute substantially to long-term average noise levels, but could consist of some intrusive sounds. Noise levels from typical construction equipment such as road graders, backhoes, heavy trucks, and bulldozers range from 80 A-weighted decibels to 85 decibels at 50 ft (USDOT 2011). Noise associated with construction under Alternative B could affect residents, park users, and wildlife in the area. However, best management practices would be employed during these activities to minimize noise. Sounds generated from these activities would be temporary, lasting only as long as the construction activity was occurring and would be limited to daytime working hours. During construction of multiple use lanes and other traffic-calming devices, impacts to the natural soundscape would be short-term and minor. Noise in the aquatic habitat would have a greater effect on wildlife as the sounds associated with placement of the pilings and creation of the emergent marsh would travel farther than noise associated with construction equipment in terrestrial habitats. These impacts are expected to be moderate, short-term and adverse.

Beyond the construction timeframe, use of the park roads with proposed improved safety features would not measurably increase sound levels from those produced under the No-Action Alternative.

7.2.9.1.5 Summary of Impacts to the Physical Environment

Impacts to the physical environment from implementation of Alternative B of the Bike and Pedestrian Use Enhancements at Davis Bayou Project would include:

- Short-term impacts to geology and substrates would be moderate and adverse as a result of ground disturbance from soil removal, grading, and vegetation clearing. Over the long-term, the new road configuration would have minor, adverse impacts to geology and substrates from the increased potential for foreign material to integrate into the natural soil regimen. Impacts to

submerged geology and substrate from the pilings and dredging in the marsh and bayou would be minor to moderate, long-term, and adverse.

- Short-term impacts to hydrology, water quality, and floodplains would be associated with construction activities, placement of pilings, and creation of emergent marsh. Impacts to surface hydrology would be moderate and long-term but would also be site-specific and limited to areas where wetland hydrology would be altered. Impacts to hydrology at east Stark Bayou would be long-term and beneficial. Impacts to surface and groundwater water quality in this area would be minor. Impacts to the natural functioning of the floodplain would be minor.
- Short-term impacts to air quality and green house gas emissions would be localized and minor during construction as a result of emissions produced from the use of machinery. Actions proposed under Alternative B would not be anticipated to change the level of motor vehicle traffic within the park, the local area, or the region and therefore, over the long-term, impacts to GHG emissions would be minor.
- Short-term impacts to the natural soundscape would be minor and adverse during construction of multiple use lanes and other traffic-calming devices from the use of equipment and noise from construction activities. Short-term moderate impacts are also expected in aquatic environments during the placement of pilings and the creation of emergent marsh.

7.2.9.2 Biological Environment

7.2.9.2.1 Living Coastal and Marine Resources

The Final Phase III ERP/PEIS states, “Some recreational enhancement projects may have long-term beneficial effects on wetlands, barrier islands, beaches, coastal transition zones, SAV and shallow water habitats. For example, enhancement projects could reduce degradation and recreation use in habitats in settings where recreation usage that is currently diffuse is redirected to a site that is more appropriate and conducive to recreational activities”. Impacts discussed in the Final Phase III ERP/PEIS that are relevant to the Bike and Pedestrian Use Enhancements at Davis Bayou Project include: “Soil erosion, vegetation trampling, vegetation removal, or other human activity from project staging or construction, or implementation of recreational enhancements” and “Localized plant species displacement or loss, introduction of invasive species, and degradation of habitats including potential habitat fragmentation as a result of an increased recreational activity and human encroachment in habitats, such as beaches or wetlands”. It also states that “These effects would depend on the size and scale as well as the location of facilities. Effects would also vary depending on presence of sensitive habitats and availability of other similar sensitive habitats in the project vicinity”.

Wetlands

For this project type, impacts to habitats were analyzed adequately within the PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. None of the areas associated with construction of a multiple use travel lane contain submerged aquatic vegetation such as seagrass. However, the construction of multiple use lanes would adversely affect wetlands adjacent to the proposed project area in the Davis Bayou Area. Impacts are expected to be minor due to the small

size of the project footprint in relation to the amount of surrounding wetlands and the mitigation measures that would be in place (see below). Long-term, minor, adverse direct impacts are expected to wetlands due to the permanent loss of up to 7.3 acres of wetlands for the new multiple use lanes. Impacts to wetlands are discussed in greater detail in the Wetlands Statement of Findings in Appendix E.

For the in-water portion of this project, the proposed discharge of dredged or fill material into waters of the United States, including wetlands, or work affecting navigable waters associated with this project will continue to be coordinated with the USACE pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). The Mobile Corps District was contacted in 2014 for a preliminary discussion of the permitting process. Continued coordination with USACE and final authorization pursuant to CWA/RHA will be completed prior to project implementation once final design is completed.

The Trustee would apply for a Mississippi Coastal Wetland Protection Act Permit and authorization by the USACE. Pursuant to the Coastal Zone Management Act of 1972, federal activities must be consistent to the maximum extent practicable with the federally approved coastal management programs for states where the activities would affect a coastal use or resource. Federal Trustees are submitting consistency determinations for state review coincident with public review of this document. The Trustee would adhere to all conditions of the Mississippi Coastal Wetland Protection Act permit and the USACE permit.

Construction activities, the placement of pilings, and the creation of emergent marsh habitat may affect wetlands and aquatic habitat due to fill and erosion. The release of sediments during construction would be controlled using best management practices and mitigation as described below to protect soil resources, prevent the transport of sediment into waterways, confine impacts to the construction sites, and to minimize the magnitude of the impacts on downstream water quality. Further, revegetation of disturbed sites would be started as soon as practical after work in an area was completed.

Because of the proven effectiveness of best management practices, discharge of sediment to waterways that would impact aquatic habitat quality would be minor and short term. Additionally, best management practices, along with other avoidance, mitigation and permit conditions required by state and federal regulatory agencies would be used to minimize impacts to habitat. As such, impacts to living coastal and marine resources in this area would be minor.

Since the final design has not been completed for the project, the exact extent of mitigation required is unknown. A wetland mitigation plan would follow the “Required Components of a Mitigation Plan” (33 CFR (c)(1)(i)). The mitigation plan would be expected to include prescribed burns of wetland areas outside the study corridor in the Davis Bayou Area to mitigate for loss of function to palustrine wetlands. Many of the wetland areas in the Davis Bayou Area have extremely thick understory of loblolly pine saplings, sweetgum saplings, swamp titi, green briar, wax myrtle, and red maple. This understory limits the regeneration of the longleaf pine, and limits the availability of longleaf pine savannahs that were once prevalent in the area. Prescribed burns would help to remove the thick understory, allow for longleaf pine regeneration, and improve the functional value of the existing wetlands.

Mitigation proposed for impacts to tidal wetlands would include improvements to tidal flow to the 4.95-acre part of east Stark Bayou that lies east of Park Road. This will be done by installing a bottomless, 20-ft-wide culvert under Park Road, replacing the 3x3-ft square concrete culvert that is there currently. This will improve the hydrologic regime in that area significantly, allowing the marsh to function more naturally. The current culvert and roadbed is a bottleneck to both the free sheet flow of water and the free movement of fish, wildlife, and aquatic organisms between the 4.95-acre area east of Park Road and the rest of Stark and Davis Bayous. Restoring the natural flow by installing a larger bottomless culvert would improve wetland habitat east of Park Road by improving water quality and water levels by increasing both the degree and the rate of exchange of water in/out of this area. Restoring the free movement of fish, wildlife, and aquatic organisms would improve wetland habitat east of Park Road by allowing a much greater and more natural interaction of fauna with the physical and floral components of that habitat, thus helping shape it and improve it. Additionally, during tropical storm events, the road frequently is underwater and stormwater movement is often restricted by the existing culvert. The new bottomless culvert would lessen the opportunities for stormwater to inundate the road.

Mitigation proposed for impacts to EFH would include the creation of approximately one acre of marsh. The marsh creation activities would result in long-term and beneficial impacts to the wetlands resources in Stark Bayou.

Additionally, BMPs would be implemented during construction to help reduce impacts to wetlands during construction. These would include:

- Buffers between areas of soil disturbance and wetlands or waterways would be planned and maintained.
- Soil erosion best management practices such as sediment traps, erosion check screen filters, and hydro mulch to prevent the entry of sediment into wetlands would be used.
- Any hazardous waste that is generated in the project area would be promptly removed and properly disposed of.
- Equipment would be inspected for leaks of oil, fuels, or hydraulic fluids before and during use to prevent soil and water contamination. Contractors would be required to implement a plan to promptly clean up any leaks or spills from equipment, such as hydraulic fluid, oil, fuel, or antifreeze.
- Onsite fueling and maintenance would be minimized. If these activities could not be avoided, fuels and other fluids would be stored in a restricted/designated area, and fueling and maintenance would be performed in designated areas that are bermed and lined to contain spills. Provisions for the containment of spills and the removal and safe disposal of contaminated materials, including soil, would be required.
- Actions would be taken to minimize effects on site hydrology and fluvial processes, including flow, circulation, water level fluctuations, and sediment transport. Take care to avoid any rutting caused by vehicles or equipment.

- Measures would be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering wetland areas. Action would be consistent with state water quality standards and Clean Water Act Section 401 certification requirements.
- Appropriate erosion and siltation controls would be maintained during construction.
- Fill material would be properly maintained to avoid adverse impacts on aquatic environments.

Emergent and Terrestrial Habitat

The construction of multiple use lanes would expand the development footprint in the Davis Bayou Area, resulting in a localized loss of terrestrial vegetation and habitat, as well. Vegetation would be removed for the construction of the new multiple use lanes. Where plantings or seedlings are required for construction of new lanes, native plant material must be obtained and used in accordance with NPS policies and guidance. Removal of the large mature pines and oaks growing close to Park Road and Robert McGhee Road would be avoided to the extent possible. Impacts to aesthetics associated with these trees are discussed in Section 7.2.7.3.5. Removal of these trees would have minor, long-term adverse impacts to the southern mixed hardwood forest. Management techniques must be implemented to foster rapid development of target native plant communities and to eliminate invasion by exotic or other undesirable species. Construction vehicles will abide by controls for invasive species and mitigation measures would be similar to those described above under the wetlands section and below within the wildlife and wildlife habitat section.

For a discussion on the possible effects of invasive species, see the Wildlife and Wildlife Habitat section below.

Wildlife and Wildlife Habitat

Under Alternative B, in the short-term, construction activities, placement of pilings, and mitigation for EFH would likely impact wildlife in the area due to general human disturbance, increased noise, and the potential for erosion. Project activities could result in the temporary displacement, injury, or death of wildlife. However, avoidance of the area by wildlife during construction would be anticipated and there is sufficient suitable feeding and resting habitat available in the Davis Bayou Area surrounding the project areas to support additional wildlife use. Wildlife would be expected to move away from areas of active construction and resume normal foraging, and resting behaviors. In addition, conservation measures would be implemented to minimize impacts to wildlife from the project to the maximum extent practicable (see below). The release of sediments during construction would be controlled using best management practices and mitigation as described below. Any adverse effects are anticipated to occur on an individual level rather than a population level. Overall, construction activities would be expected to have short-term, minor impacts on wildlife.

Project activities would expand the footprint of the existing road infrastructure into wildlife habitat, and this permanent loss of habitat would result in long-term adverse impacts. However, since the footprint increase would be relatively small compared to the available habitat in the entire Davis Bayou Area, sufficient habitat could remain functional at both the local and regional scales to maintain the viability of the species living there. As such, impacts to wildlife habitat would be minor, adverse, and long-term.

The potential introduction of terrestrial and aquatic non-native invasive species of plants, animals, and microbes is a concern for any proposed project. Non-native invasive species could alter existing terrestrial or aquatic ecosystems, may cause economic damages and losses, and are the second most common reason for protecting species under the Endangered Species Act. The species that are or may become introduced, established, and invasive are difficult to identify. The analysis focuses on pathway control or actions/mechanisms that may be taken or implemented to prevent the spread of invasive species on site or introduction of species to the site. Some plant surveys have been conducted in the Davis Bayou Area.

This project involves the removal of some vegetation and the placement of fill and some retaining walls along the existing road into or adjacent to areas that are currently forests, forested wetlands, and intertidal marsh. A variety of construction equipment would be used. Each of these actions and pieces of equipment serve as a potential pathway to introduce or spread invasive species. BMPs would be implemented to ensure these pathways are "broken" and do not spread or introduce species (See BMPs listed below). The implementation of these BMPs meets the spirit and intent of EO 13112. Due to the implementation of BMPs, the Trustees expect risk from invasive species introduction and spread to be short-term and minor.

The Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review would result in the avoidance and minimization of the introduction and spread of invasive species:

- All equipment to be used during the project, including personal gear, would be inspected and cleaned such that there is no observable presence of mud, seeds, vegetation, insects, and other species;
- Fill material would be locally sourced if possible and properly maintained to avoid adverse impacts on wildlife and aquatic environments or public safety.

Fish and Fish Habitat

Under Alternative B, increased erosion caused by construction activities could result in indirect impacts to fish and fish habitat. The placement of fill and the release of sediments during construction and mitigation activities associated with EFH would be controlled using best management practices, avoidance, and mitigation, as described below, to protect aquatic resources, prevent the transport of sediment into waterways, confine impacts to the construction sites, and to minimize the magnitude of the impacts on downstream water quality. These measures would minimize impacts to fish habitat. Further, revegetation of disturbed sites would be started as soon as practical after work in an area was completed. Because of the proven effectiveness of best management practices, short-term impacts to fish and fish habitat during construction would be minor.

As part of construction, fill or pilings placed in Stark Bayou at the Robert McGhee Road crossing and East Stark Bayou at the Park Road Crossing would permanently remove a small portion of aquatic habitat, which would result in long-term, minor, adverse direct impacts to fish and fish habitat. It is expected that fishes that utilize the areas to be altered would be permanently displaced, and would use the other available habitats in the Davis Bayou Area. Impacts are expected to be realized on an individual level and

not a population level. Best management practices and mitigation as described below would be utilized to minimize impact to fish and fish habitat.

The marsh creation mitigation project would have minor, short-term adverse effects on fish and fish habitat during project implementation, but long-term beneficial impacts later due to the creation of this new marsh habitat that fish will utilize.

Specific provisions would be identified in construction contract(s) to prevent storm water pollution during construction activities, in accordance with the National Pollutant Discharge Elimination System permit program of the Clean Water Act and all other federal regulations, and in accordance with the storm water pollution prevention plan to be prepared for this project. The following mitigation measures and environmental review would protect aquatic resources:

- Buffers between areas of soil disturbance and wetlands or waterways would be planned and maintained.
- Soil erosion best management practices such as sediment traps, erosion check screen filters, and hydro mulch to prevent the entry of sediment into waterways would be used.
- Any hazardous waste that is generated in the project area would be promptly removed and properly disposed of.
- Equipment would be inspected for leaks of oil, fuels, or hydraulic fluids before and during use to prevent soil and water contamination. Contractors would be required to implement a plan to promptly clean up any leaks or spills from equipment, such as hydraulic fluid, oil, fuel, or antifreeze.
- Onsite fueling and maintenance would be minimized. If these activities could not be avoided, fuels and other fluids would be stored in a restricted/designated area, and fueling and maintenance would be performed in designated areas that are bermed and lined to contain spills. Provisions for the containment of spills and the removal and safe disposal of contaminated materials, including soil, would be required.
- Actions would be taken to minimize effects on site hydrology and fluvial processes, including flow, circulation, water level fluctuations, and sediment transport. Care would be taken to avoid any rutting caused by vehicles or equipment.
- Measures would be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering wetland areas. Action would be consistent with state water quality standards and Clean Water Act Section 401 certification requirements.
- Appropriate erosion and siltation controls would be maintained during construction.
- Fill material would be properly maintained to avoid adverse impacts on aquatic environments or public safety.
- All contractors and their employees would be trained regarding safety protocols, and food storage regulations. Storage and handling of food, fuel, and other attractants would be required to minimize potential conflicts with wildlife. All project crews would be required to meet standards for sanitation, attractant storage, and access.
- Construction workers and supervisors would be informed about the potential for special status species in the work area. Contract provisions that require a stop in construction activities if a

special status species is discovered until NPS staff members evaluate the situation would be included. Protection measures would be modified as appropriate to protect the discovery.

- Measures would be implemented to reduce adverse effects caused by nonnative plants and wildlife on candidate, threatened, and endangered species.

Essential Fish Habitat

Impacts to EFH from the project could be caused by impacts to water quality, surface water hydrology, and available emergent marsh and soft bottom habitat. Impacts to water quality could be caused by erosion from construction activities (ground disturbance, the addition of fill, or the placement of pilings) and by leaks or spills of fuels or fluids from construction equipment and vehicles. Because of the proven effectiveness of BMPs, the impacts to water quality from the discharge of sediment to waterways and contamination from equipment and vehicles would be short-term, minor and adverse. BMPs that will be employed to protect water quality are listed in the Hydrology, Water Quality, and Floodplains section above.

Impacts to hydrology could be caused by the footprint of the newly added fill in the emergent marsh adjacent to the roads. Fill could be placed on both sides of each road. The actual amount of estuarine emergent marsh to be covered with fill is up to 0.69 acres – 0.46 acres at Robert McGhee Rd and 0.23 acres at Park Rd. These impacts would be long-term, minor and adverse. The impacts to EFH would be minor because a) such a small area – 1.2% of the entire tidal marsh acreage in the Davis Bayou Area (52 acres) – would be covered, and b) the impacts will be mitigated.

The mitigation being proposed for impacts to EFH is within the NPS boundary of the Davis Bayou Area. Since up to 0.69 acres could be destroyed, 1.5 times that – i.e., 1.035 acres, or one acre – would be created to mitigate those impacts (see Figure 7-9 below). For the impacts along Park Road, this equals 0.35 acres (i.e., 1.5 x 0.23), and for the impacts assumed along Robert McGhee Road, this equals 0.69 acres (i.e., 1.5 x 0.46). NPS proposes to mitigate the impacts from the current phase of the project – i.e., along Park Road – now, and mitigate the remainder when the Robert McGhee Road portion of the project is funded, designed, and implemented. Approximately three acres of sediment material borrow areas will be needed to provide enough material to create 0.35 and 0.69 acres of marsh.

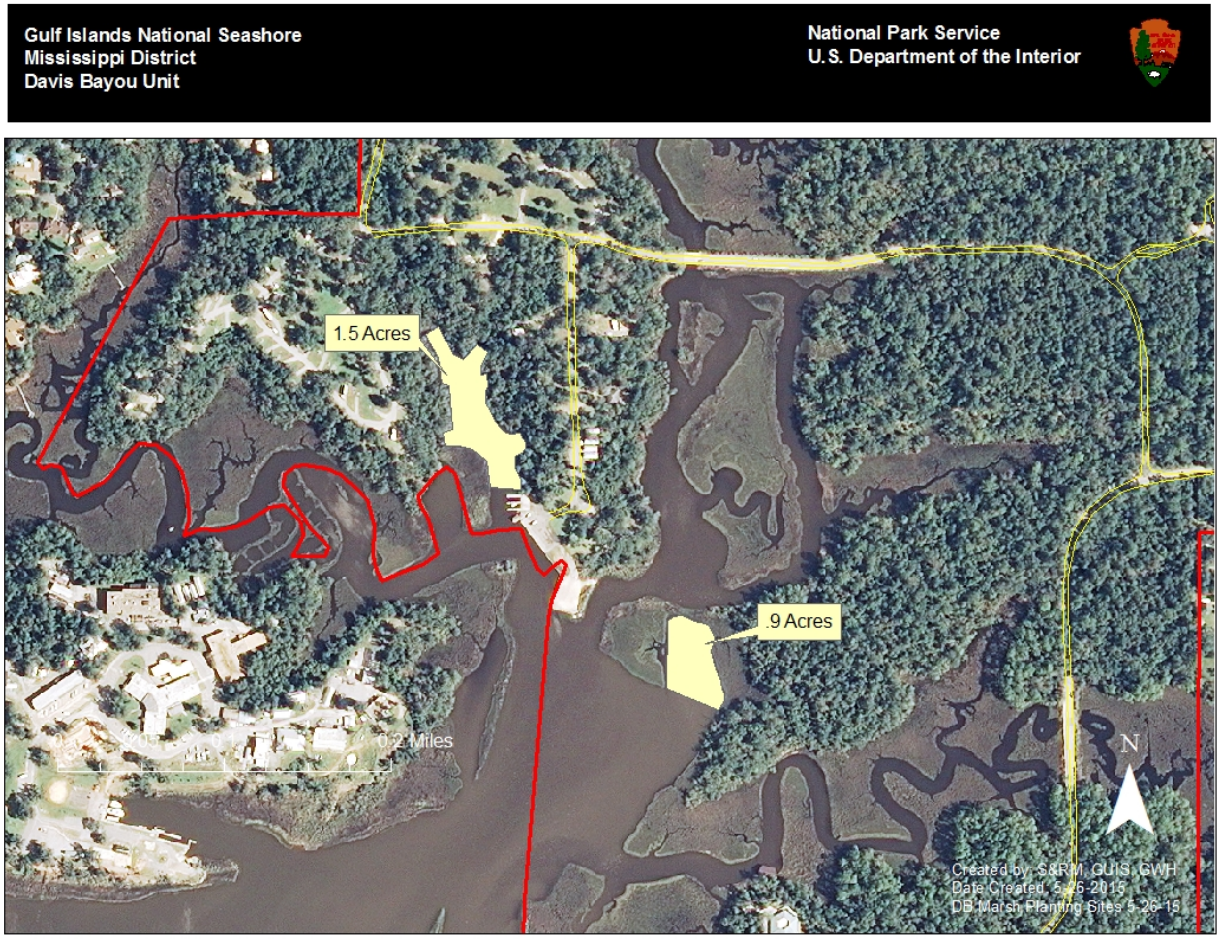


Figure 7-9 - Proposed locations for marsh creation mitigation project (red line is park boundary).

Planting Plan details for the created marsh will be determined before mitigation is implemented; however, some details can be prescribed now. Plants material will come from plant donor sites in the park or be purchased from nurseries and will be planted on no greater than six-ft centers. Only species and forms (e.g., sprigs, bare roots, plugs, gallon containers) that are appropriate for the sites will be planted. Plant material will meet the required genetic specifications. Planting will occur after the dredged material has had time to consolidate sufficiently (approximately three months). Performance criteria include: 1) having 80% or more of the created marsh to be within six inches of the desired elevation one calendar year and three calendar years after placement; 2) having at least 75% vegetative coverage one year after planting and 90% or higher coverage within three years. Vegetative coverage assessments will be designed later, but would involve something in the range of 20 two-meter randomly distributed plots over the one-acre area. Photo-monitoring of plots should also occur and any use of the area by animals would be reported.

Should pilings be installed rather than fill, impacts to EFH would still be minor, short-term and adverse, but even less impactful than fill because the footprint would be so much smaller.

NMFS concurred with this EFH assessment on June 2, 2015 (NOAA 2015a).

7.2.9.2.2 Protected Species

Through coordination with the U.S. Fish and Wildlife Service and management agencies for Mississippi, listed species were identified that may be in or near the Davis Bayou Area as described in Section 7.2.6.2.2. Information on each species, including their preferred habitat, prey, and foraging areas, was gathered. Impacts on special status species were determined based on the following criteria:

- Species are found in areas likely to be affected by management actions or associated activities described in the alternatives;
- Potential impacts on wildlife species from management actions or visitor use include inducing flight and alarm responses, disrupting normal behaviors and causing stress, degrading habitat quality, and potentially affecting reproductive success;
- Displacement and disturbance potential of the actions, and the species' potential to be affected by project activities;
- Plant species at risk from direct and indirect impacts associated with proposed development;
- Mitigation measures designed to lessen impacts on special status species.

Federally and state-listed threatened and endangered species are addressed together in this section, because many of these species (1) have dual federal and state special status, (2) occur in the same habitats, or (3) would be impacted similarly under each alternative.

Potential impacts to protected species and their critical habitat, and to species of concern, is presented in Table 7-7 and discussed below.

Table 7-7. Potential Impacts from Alternatives B to Protected Species at the Davis Bayou Area of Gulf Islands National Seashore

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	MS RANK	DETERMINATION
Haliaeetus leucocephalus	Bald Eagle	DM		Minor impacts
Pelecanus occidentalis	Brown Pelican		S1	Minor impacts
Reptiles				
Alligator mississippiensis	American Alligator	SAT		Minor impacts
SAT = Similarity of Appearance (Threatened;, DM = Delisted, Monitored; S1 = critically imperiled *Source:* USFWS, 2015; Mississippi Museum of Natural Science, 2001.				

There would be no impacts to federally listed threatened or endangered species under Alternative B because no currently listed threatened or endangered species are known to occur in the project area. The only species known to occur in the project corridor that is protected under the Endangered Species Act is the American alligator. The alligator is considered fully recovered from its listing as an endangered species and only remains on the threatened species list due to its similarity of appearance with the

endangered crocodile. The U.S. Fish and Wildlife Service regulates the hunting and legal trade of alligator skins and products, but it no longer considers alligator populations to be imperiled (NPS 2014a).

In general, impacts to protected species from the installation of a multiple use lane would be minor due to the small size of the project footprint in relation to available habitat, the mitigation measures in place, and the ability of most of these species to avoid disturbed areas. Development of the multiple use lane would require clearing of vegetation and filling of up to 7.3 acres of wetlands. This permanent loss of habitat would result in long-term, direct, minor, adverse impacts to protected species.

Potential indirect, adverse impacts on protected species from the proposed action mainly would involve displacement of wildlife populations from the project area. Most wildlife would be already accustomed to traffic and visitors along the road adjacent to the project area. Movement of the limited numbers of wildlife that currently inhabit this small area into surrounding, unaffected habitats would not be expected to result in exceedances of the carrying capacity of the extensive, adjacent habitats. Therefore, impacts would be minor.

Best management practices, along with other avoidance, mitigation, and permit conditions required by state and federal regulatory agencies would be used to minimize impacts to habitat. Mitigation measures to protect federally listed threatened and endangered species would be the same as those described above for wildlife, fish, and their habitats.

The Trustees have determined that the proposed project would have no effect on the threatened and endangered species potentially found in the project area. In May 2015, the Trustees requested concurrence from the USFWS regarding this determination (DOI 2015). The U.S. Fish and Wildlife Service provided concurrence with this determination on June 1, 2015 (USFWS 2015). Coordination with NOAA took place and no effect for species under NOAA's jurisdiction was determined (NOAA 2015b).

Bald and Golden Eagles, Migratory Birds, and Other Birds of Conservation Concern

The Trustees have reviewed the project site and determined that bald eagles use areas near the project area for foraging and resting, but not nesting. Golden Eagles will not be affected since they do not occur in the project area.

The Trustees have reviewed the project site and determined that migratory bird nesting occurs in the Davis Bayou Area, but is not likely to occur within the project area. Coordination under MBTA is ongoing between the Trustees and the U.S. Fish and Wildlife Service. Pre-construction nesting surveys would be conducted; if evidence of nesting were found, coordination with the U.S. Fish and Wildlife Service would be initiated to develop and implement appropriate conservation measures.

Short-term construction activities taking place outside the nesting season would likely impact migratory birds, including bald eagles, and other birds of conservation concern, due to general human disturbance and increased noise. These species would be expected to move away from areas of active construction to other adjacent areas and resume normal foraging, resting, and loafing behaviors. There is sufficient suitable feeding and resting habitat available in the Davis Bayou Area surrounding the project areas to support additional bird use. In addition, the conservation measures listed below would be implemented

to minimize impacts to migratory birds and other birds of conservation concern from the project to the maximum extent practicable. Therefore, impacts from the noise and disturbance of construction activities would be short-term and minor.

The following conservation measures would be implemented specifically for bald eagles, including in the unexpected event that a nest were found in the project area:

- If bald eagle breeding or nesting behaviors are observed or a nest is discovered or known, all activities (e.g., walking, camping, clean-up, use of a UTV, ATV, or boat) should avoid the nest by a minimum of 660 feet. If the nest is protected by a vegetated buffer where there is no line of sight to the nest, then the minimum avoidance distance is 330 feet. This avoidance distance shall be maintained from the onset of breeding/courtship behaviors until any eggs have hatched and eaglets have fledged (approximately 6 months);
- If a similar activity (e.g., driving on a roadway) is closer than 660 feet to a nest, then you may maintain a distance buffer as close to the nest as the existing tolerated activity;
- If a vegetated buffer is present and there is no line of sight to the nest and a similar activity is closer than 330 feet to a nest, then you may maintain a distance buffer as close to the nest as the existing tolerated activity;
- In some instances, activities conducted within 660 feet of a nest may result in disturbance, particularly for the eagles occupying the Mississippi barrier islands. If an activity appears to cause initial disturbance, the activity shall stop and all individuals and equipment will be moved away until the eagles are no longer displaying disturbance behaviors.

Impacts to migratory birds and other birds of conservation concern would be minimized using applicable mitigation measures listed in the Final Phase III ERP/PEIS Chapter 6, Appendix 6-A, page 3. Additionally, measures that would be implemented for this project include:

- Using care to avoid birds when operating machinery or vehicles near birds;
- Surveys for nests prior to construction activities;
- USFWS Bald Eagle Management Guidelines and Conservation Measures would be followed during implementation of the proposed action;
- No work would occur within 660 feet of any bald eagle or osprey nests. Care would be taken to avoid working near other raptor nests, and to minimize noise and vibration in their vicinities. A staff biologist would advise the contractor of the nesting status of all identified raptor nests near the project area and approve of work in the vicinity;
- Care would be taken to minimize noise and vibration near areas where foraging or resting birds were encountered;
- Tree removal would be timed to occur outside of nesting seasons. Care would be taken to minimize noise and vibration near areas where foraging or resting birds are encountered.

7.2.9.2.3 Summary of Impacts to the Biological Environment

Impacts to the biological environment from implementation of Alternative B of the Bike and Pedestrian Use Enhancements at Davis Bayou Project would include:

- Short-and long-term impacts to living coastal and marine resources would be minor and adverse and would result from the use of fill, the placement of pilings, creation of emergent marsh habitat, the potential for erosion, and the disturbance during construction activities, the resulting expanded development footprint, and the removal of vegetation. Removal of some mature trees would have minor, long-term adverse impacts to the southern mixed hardwood forest. There would be long-term beneficial impacts to wetlands and EFH from mitigation projects.
- There would be no impacts to federally threatened or endangered species under Alternative B. Short-term impacts to protected species would be minor and adverse due to general human disturbance and increased noise during construction. Long-term impacts would be minor and adverse from displacement resulting from the permanent loss of wildlife habitat from the clearing of vegetation and the loss wetlands.

7.2.9.3 Human Uses and Socioeconomics

7.2.9.3.1 Socioeconomics and Environmental Justice

Section 6.6.1 of the Final Phase III ERP/PEIS states that project types that contribute to providing and enhancing recreational opportunities "are not, in general, expected to create a disproportionately high and adverse effect on a minority or low-income population…" "Project spending would also benefit regional economies. Project construction or implementation spending is likely to occur under projects to enhance public access to natural resources for recreational use and to enhance recreational experiences…" "Project spending would support workforce to design, engineer, manage, and carry out the projects. Additionally, locally purchased (or rented) equipment and materials would also benefit the regional economy."

"Short-term beneficial impacts to the local and regional economy would occur from construction jobs and workforce. These jobs would support income, sales, and downstream economic activity in the regional economy. The level of regional benefit would vary by project and would depend on the magnitude and level of effort necessary for each project, the sourcing of labor and materials, and the size of the economy in which the project is located."

For this project type, socioeconomics and environmental justice impacts were analyzed adequately within the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative B, temporary employment generated by construction activities would result in wages paid as well as an increase in sales and expenditures for local and regional services, materials, and supplies. Temporary jobs would be created mainly in the construction services sector for design and completion of the proposed improvements. Additional temporary jobs may also be created in landscaping and or consulting services for projects related to any tree and

vegetation removal, wetland mitigation, and the proposed signage and safety improvements along the route. All jobs created would be temporary and limited to the construction phase of the project. Greater impacts would be realized should the project move forward with the installation of a multiple use lane and widening of Park and Robert McGhee Roads. These short-term construction-related economic impacts would all be considered beneficial.

During road-safety improvement activities, some visitors could avoid the Davis Bayou Area because of perceived reductions in experience quality and could choose alternative locations in or outside of the National Seashore. However, these construction activities would take place before the height of the visitor season and alternative routes would remain open and accessible. A loss of these visitors and their expenditures would represent an unnoticeable impact on the economy of the county. Following the completion of the project, there may be increased visitation at the park due to the improvements. This may result in some increased spending near the park.

Although there may be additional noise, traffic, and dust during the constriction that may affect residents and users, construction standards would be in place to minimize impacts. It is not anticipated that impacts would be any greater or more severe on minorities or individuals below the poverty line than non-minorities and those who are above the poverty line. None of the road safety improvements or associated activities would disproportionately affect low-income populations or minority populations. Impacts would also be localized and short-term.

Impacts to socioeconomics and environmental justice would be minimized using applicable mitigation measures listed in the Final Phase III ERP/PEIS Chapter 6, Appendix 6-A, page 20. Measures that would be implemented for this project include:

- Local companies and workforces should be used for construction or implementation the project if possible to support local economic benefits.

7.2.9.3.2 Cultural Resources

Section 6.6.2 of the Final Phase III ERP/PEIS states that project types that contribute to providing and enhancing recreational opportunities "could potentially have a minor to moderate, long-term adverse impact on cultural resources from ground and substrate disturbing construction activities and dredging activities…" In addition, these project types could have "long-term beneficial impacts through the identification of cultural resources. Cultural or historical sites that may otherwise have been unknown or unprotected may benefit from the NHPA Section 106 review process that could require it be avoided and preserved in its natural state."

For this project type, socioeconomics and environmental justice impacts were analyzed adequately within the Final Phase III ERP/PEIS. For the proposed project, under Alternative B, ground disturbance would occur in existing road corridors to accommodate up to 14 additional feet of asphalt, 8 feet of non-paved shoulders, plus, if fill material is added, the footprint of that, plus 5 feet from the toe of slopes for construction and heavy equipment maneuvering. The four known archeological sites lie within or overlap areas that would include ground disturbance during construction activities proposed in alternative B. In accordance with Section 106 of the NHPA, the National Park Service is consulting with

the Mississippi SHPO. If the National Park Service determines that ground disturbance would lead to a substantial loss of important cultural information potential contained in a NRHP-eligible site, it would implement mitigation measures deemed appropriate to offset any potential loss. Such mitigation could range from documentation and curation of artifacts to creation and placement of interpretive signage and would be arrived at through consultation with the Mississippi SHPO. If previously unknown archeological resources are discovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented. If the resources could not be preserved in situ, an appropriate mitigation strategy would be developed in consultation with the SHPO and, as necessary, American Indian tribes. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001) of 1990 would be followed. If non-Indian human remains were discovered, standard reporting procedures to the proper authorities would be followed, as would all applicable federal, state, and local laws.

While the project has the potential to cause a loss of important cultural information potential, appropriate implementation of mitigations developed in consultation with the Mississippi SHPO would ensure that any adverse impacts to cultural resources under Alternative B would not exceed a minor degree of intensity. Because of their irreplaceable nature, all impacts to cultural resource are considered long-term. For the purposes of NHPA Section 106, 'adverse effect to historic properties' would be the determination submitted to the Mississippi SHPO for actions associated with implementation of Alternative B should any of the four sites be determined NRHP-eligible. Should all four be determined ineligible for NRHP listing, the NHPA Section 106 determination of effects submitted to the Mississippi SHPO would be 'no historic properties affected.'

Impacts to cultural resources would be minimized using applicable mitigation measures listed in the Final Phase III ERP/PEIS Chapter 6, Appendix 6-A, page 19. The primary measure that would be implemented for this project is:

- Conducting preconstruction surveys for the presence of cultural resources and/or monitoring cultural resources during construction in the vicinity of the development.

A Section 106 review of this project is currently underway. If any historic properties are determined to be in the project's area of potential effect, all adverse effects would be resolved prior to construction in that vicinity.

7.2.9.3.3 Infrastructure

Section 6.6.3 of the Final Phase III ERP/PEIS states this project type "would involve the transport of construction vehicles, equipment, and materials. These project types, which include techniques such as construction of boardwalks and trails, could lead to short and long-term minor to major impacts on infrastructure. The impacts associated with these projects would result from increases in construction traffic; temporary or permanent closure of roads, parking lots, or facilities; or damage to roadways or other infrastructure that provides access to the shoreline. The impacts to existing infrastructure, such as roadways, could also occur from increased vehicle use as a result of increased visitor use over time.

These impacts would range in intensity based on the duration of road, parking lot or public access closure, the importance of individual roadways as regional transportation arterials; and the extent and duration of damage to roadways, facilities, or access points. Future infrastructure improvements or increased maintenance could be necessary to address impacts to infrastructure".

"Projects that upgrade existing infrastructure or add new infrastructure, such as …trails, boardwalks, and similar types of public access; and many of the other project types discussed above, would have long-term beneficial impacts to infrastructure".

For this project type, the impacts to infrastructure are adequately analyzed in the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis.

Roadways

The addition of two 10-ft elliptical traffic-calming medians within the first mile of Park Road would result in minor impacts to traffic patterns and road infrastructure by slowing traffic speeds within this area. Installation of multiple use travel lanes along Park Road and Robert McGhee Road would add additional infrastructure to the Davis Bayou Area. During construction, existing roads would be used to access the project areas and there would be short-term minor to moderate impacts to infrastructure as a result of any temporary closures and/or minor traffic jams resulting from equipment transiting the roadways. Following construction, long-term direct impacts to traffic patterns and the roadway infrastructure would be beneficial due to a reduction in user conflicts along the roadways. While it is anticipated that road bicyclists would continue to use the roadways, other recreational users would likely utilize the multiple use lanes and thereby reduce the potential for accidents caused by cars passing recreational users, with resulting beneficial impacts. Additionally, during tropical storm events, the road frequently is underwater and stormwater movement is often restricted by the existing culvert. The new bottomless culvert would have a long-term beneficial impact because it would lessen the chances of stormwater inundating the road.

Public Utilities

There is the potential, depending on the design layout, that electrical utility lines within the park would need to be replaced/relocated during construction of the multiple use lanes. Any replacement would be done with limited or no disruption to service. This would result in short-term minor impacts to utilities depending on the location and timing of construction and planning efforts of the utility provider. It is not anticipated that there would be any impacts to any of the other utilities within the park. No other utilities would be affected.

7.2.9.3.4 Land and Marine Management

The Final Phase III ERP/PEIS states that this project type "would have varying impacts on land and marine management depending on the type of management or land ownership applicable to the project site. Projects would generally be consistent with the prevailing management plans and direction

governing the use of the land and marine areas where the projects would take place; therefore,…are generally expected to have no adverse impacts to land and marine management ".

"Projects implemented at national, state, and local parks, wildlife refuges, and wildlife management areas could have short-term minor to moderate adverse impacts to land and marine management. These impacts would be temporary, and would occur as a result of construction activities related to projects such as the construction of new roads, trails, boardwalks, and other public access improvements; or the construction of boat ramps, piers, lodging facilities, public restroom, campgrounds, and similar facilities. Impacts would be related to temporary, full, or partial closures of parks and refuges. In the long-term, projects…would have beneficial impacts on land and marine management at parks and wildlife refuges, and wildlife management areas because these activities would improve public access and amenities, helping park management and staff fulfill their obligations to manage these properties for the benefit of the environment and human enjoyment"

For this project type, the impacts to land and marine management are adequately analyzed in the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative B, a Coastal Zone Management Act consistency determination would be submitted for state review and concurrence before project implementation. No changes would occur to the current land use at the project site or the adjoining shoreline areas. The area would remain zoned for diverse visitor opportunities and land use, and management authority at the Davis Bayou Area would remain under the purview of the National Seashore. Thus, no impacts would occur to land and marine management under Alternative B.

7.2.9.3.5 Aesthetics and Visual Resources

The Final Phase III ERP/PEIS states that this project type "would have minor to moderate short-term adverse impacts from the temporary landscape during the construction period from the presence of bulldozers, front-loaders and other large earth moving equipment required for upgrades or new facilities. These impacts would constitute a change in the viewshed that is readily apparent and which would attract attention in the short-term. Although such changes would not dominate the viewscape, they could detract from the current user activities or experiences. Over the long-term, the addition of infrastructure and facilities into the existing setting would present some degree of visual contrast. Long-term adverse effects of these enhancements would range from minor to moderate, depending on the existing aesthetic character of the surrounding landscape. Where the addition of these facility enhancements into the existing setting would present a large degree of visual contrast, impacts would be moderate because they would detract from the current user activities or experiences."

For this project type, impacts to aesthetics and visual resources were analyzed adequately within the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative B, the existing road corridor would be altered to accommodate up to 14 additional feet of asphalt, and 8 ft of non-paved shoulders. In areas where fill is added along the existing road, the footprint of that slope would extend out the least extent possible (distance is currently unknown due to uncertainty of design), and there would be a 5-ft equipment work area extending out from the toe of the slope. In addition, new signage and traffic-calming devices would be

installed along portions or Park Road. Short-term adverse impacts could result from the temporary presence of construction equipment along the roads, and in the estuary where intertidal emergent marsh creation would occur as mitigation for impacts to EFH. Mature tree canopy would be avoided to the greatest extent possible; however, some mature trees would be removed. Views of the bayou would remain intact. The natural landscape and soundscape in the project area would not be appreciably altered by changes in vehicular traffic or other intrusions. Additional signage and traffic-calming elements, as well as any necessary retaining walls, would reflect a context-sensitive design. As such, long-term impacts to aesthetics or visual resources resulting from Alternative B would be minor.

7.2.9.3.6 Tourism and Recreational Use

Section 6.6.5 of the Final Phase III ERP/PEIS states, "Recreational enhancement project types that include techniques such as beach re-nourishment, placing materials to create reef structures, and enhancing recreational infrastructure could provide long-term benefits to tourist and recreational uses by improving wildlife habitat, and increasing recreational amenities (such as beach facilities). As a result, these types of projects would enhance wildlife viewing, hunting, beach and waterfront visitors, fishing and tourist experiences and provide additional areas in which to experience these opportunities".

For this project type, the impacts to tourism and recreation are adequately analyzed in the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. During construction of the multiple use lanes, recreational experience would be impacted from noise and visual disturbances associated with the use of heavy equipment. Use of and access to some park areas could be impacted by temporary closures. These temporary inconveniences would result in moderate short-term impacts on tourism and local recreational use during construction. While much of the road-based recreational use of the Davis Bayou Area comes from local residents, short-term impacts during construction would be kept slightly lower by implementing construction during the slowest part of the tourist season.

Over the long-term, it is expected that the installation of multiple use lanes would result in beneficial impacts to the overall visitor experience by providing a travel corridor throughout the park free from motor-vehicles. Benefits to recreational use would be expected from non-motorized access to the trail networks within the park, improved safety from the separation of motorized and non-motorized use, and a more pedestrian friendly experience. Additional benefits would result from increased NPS road maintenance activities and compliance with appropriate Federal Highway Administration safety recommendations.

The addition of two traffic-calming medians within the first mile of Park Road would result in long-term benefits to the overall visitor experience by slowing traffic in this area and improving safety for both drivers and recreationalists. While residents utilizing the park roads on their daily commute may need to adjust to the traffic-calming medians, they would encourage drivers to follow the speed limit, thereby improving safety and reducing traffic violations, which would result in a long-term benefit.

Impacts to tourism and recreational use would be minimized using applicable mitigation measures listed in the Final Phase III ERP/PEIS Chapter 6, Appendix 6-A, page 17. Measures that would be implemented for this project include:

- Local companies should try to work with project leads to establish construction work times that overlap with off-season tourism schedules.

7.2.9.3.7 Public Health and Safety and Shoreline Protection

Section 6.6.9 of the Final Phase III ERP/PEIS states that this project type "involving construction and construction activities would result in short-term minor adverse impacts to public health and safety as a result of the operation of heavy equipment and construction materials as well as the potential of hazardous waste and materials contaminating soils, groundwater, and surface waters. Projects would be designed using similar safety-related BMPs to reduce hazards".

For this project type, the impacts to public health and safety and shoreline protection are adequately analyzed in the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. No hazardous waste would be created during the installation of multiple use lanes and traffic-calming medians. All hazardous materials (e.g., diesel fuels) handled during construction would be contained and appropriate barriers would be in place to ensure the protection of adjacent water resources from potential spills and leaks. Personal protective equipment would be required, as appropriate, for all construction personnel and authorized access zones would be established, if needed, at the perimeter of the project site during construction. Signage would be posted and areas deemed unsafe for the public would be temporarily closed. As a result, short-term impacts to public health and safety during construction of the multiple use lanes would be minor.

Over the long-term, the installation of multiple use lanes would widen the paved surface and would result in beneficial impacts to public health and safety by providing a travel corridor throughout the park free from motor vehicles. Benefits to public health and safety would be expected from non-motorized access to the trail networks within the park, separation of motorized and non-motorized use, and increased pavement width. While it is expected that road bicyclists may still chose to ride on the roadway surface, there would still be a benefit to public health and safety from a reduction in the amount of non-motorized use of the roadway.

The addition of two traffic-calming medians within the first mile of Park Road and a reduction in the speed limit throughout the park would result in long-term benefits to overall public health and safety by slowing traffic and improving safety for both drivers and recreationalists. Additional benefits to public health and safety would result from increased NPS road maintenance activities and compliance with appropriate Federal Highway Administration safety recommendations.

7.2.9.3.8 Summary of Impacts to the Human Uses and Socioeconomics

Impacts to the human uses and socioeconomics from implementation of Alternative B of the Bike and Pedestrian Use Enhancements at Davis Bayou Project would include:

- Short-term impacts to socioeconomics and environmental justice would be beneficial as a result of the addition of temporary jobs in the area during construction.
- While the project has the potential to cause a loss of important cultural resource information, appropriate implementation of mitigations developed in consultation with the Mississippi SHPO

would ensure that any adverse impacts to cultural resources under Alternative B would not exceed a minor degree of intensity.

- Short-term impacts to roadway infrastructure would be minor to moderate as a result of any temporary closures and/or minor traffic jams during construction. Long-term impacts would be beneficial as a result of a reduction in user conflict on the roadways and because the larger bottomless culvert would help keep the road from becoming inundated and damaged during storm surge events. Short-term, minor adverse impacts to public utilities could result if any replacement were necessary.
- There would be no impacts to land and marine management because there would be no changes to the current land use at the project site or the adjoining shoreline areas.
- Long-term impacts to the aesthetics and visual resources within the Davis Bayou Area would be minor and adverse from the additional signage and traffic-calming elements. Short-term, minor adverse impacts would result from the temporary presence of equipment during construction.
- Short-term impacts to tourism and recreational use of the Davis Bayou Area would be moderate and adverse as a result of the temporary inconvenience from noise, the visual disturbance of heavy equipment, and temporary closures during construction. Long-term impacts would be beneficial from the creation of a safer and more pedestrian friendly experience by establishing a motor-vehicle-free travel corridor.
- Short-term impacts to public health and safety would be minor during construction as a result of protection measures put in place to protect construction personnel and the public. Long-term impacts to public health and safety would be beneficial because of decreased potential for collisions and conflict resulting from a travel corridor free from motor vehicles and traffic-calming medians.

7.2.10 Environmental Consequences of Alternative C: Limit Access to VFW Road

7.2.10.1 Physical Environment

7.2.10.1.1 Geology and Substrates

As stated under the analysis for Alternative B, for this project type, geology and substrates impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under this alternative, automatic gate and park signs would be placed around the intersection of VFW Road and Knapp Road. Along the first mile of Park Road, two traffic-calming medians would be installed. Anticipated construction activities include ground disturbance, soil excavation, grading, fill activities, and vegetation clearing. During the construction, there may be increased erosion from exposed soil and compaction from equipment, but the impacts would be minor, short-term, and localized.

There would be increased potential for foreign material to integrate into the natural soil regimen especially along the portions of Park Road where the new traffic-calming medians would be placed. New material may not have the same consistency of the existing naturally developed soil and adversely impact natural geologic processes. Any impacts would be minor, adverse, and short-term.

Mitigation measures for impacts to geology and substrates would be the same as those discussed under the analysis for Alternative B in Section 7.2.9.1.1.

7.2.10.1.2 Hydrology, Water Quality, and Floodplains

As stated under the analysis for Alternative B, for this project type, hydrology, water quality, and floodplains impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Impacts to hydrology, water quality, and floodplains would be associated with construction activities. Best management practices and mitigation measures that would be applied are the same as those identified for Alternative B in Section 7.2.9.1.2.

Impacts to surface hydrology under Alternative C would be site-specific and limited to areas where wetland hydrology would be altered associated with the installation of the medians. Some of the wetlands in the study area exist because the ground water elevations are high (e.g., wet pine savannah). Though construction in these areas may reach the elevation of groundwater, it is not likely to impact groundwater hydrology due to the larger depth of the aquifer below.

Construction activities may impact surface and groundwater quality due to erosion. The release of sediments during construction would be controlled using best management practices and mitigation as described in 7.2.9.1.2 to protect soil resources, prevent the transport of sediment into waterways, confine impacts to the construction sites, and to minimize the magnitude of the impacts on downstream water quality. Further, revegetation of disturbed sites would be started as soon as practical after work in an area was completed. A loss of less than 0.5 acres of wetlands may lead to a loss of water quality functions such as groundwater discharge/recharge, sediment/toxicant retention, and nutrient removal. However, depending on the acreage of wetlands surrounding the filled areas, minor impacts could occur but would not create a noticeable difference in water quality functions. Because of the proven effectiveness of best management practices, discharge of sediment to waterways that would impact surface water quality would be minor and short term. Additionally, best management practices, along with other avoidance, mitigation and permit conditions required by state and federal regulatory agencies would be used to minimize water quality and sedimentation impacts. As such, short term, adverse impacts to surface and groundwater water quality in this area would be minor.

The placement of the medians (within the first mile of Park Road) places them in zones “X (Other Flooded Areas)” or zone “X (Other Areas)”. These areas have a lower flood risk and would lead to minor impacts on floodplains. Compacting and filling wetlands adjacent to the medians would reduce the natural features of the floodplain, which could increase flooding severity since these habitats provide a valuable ecological service (e.g., water storage and storm buffering; see wetlands sections of this EA). However, due to the large acreage of wetlands surrounding the proposed fill areas, the impacts may not create a noticeable difference in the benefits to the natural functioning of the floodplain. Because of the limited impacts to wetlands under Alternative C, impacts to the natural functioning of the floodplain would be minor.

7.2.10.1.3 Air Quality and Greenhouse Gas Emissions

As stated under the analysis for Alternative B, for this project type, air quality and greenhouse gas emissions impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Emissions of particulates that could affect air quality, including visibility in the general vicinity of the project area, could temporarily increase during construction activities to install traffic-calming measures on portions of Park Road from the use of motorized equipment at the site and from exhaust from gasoline- or diesel-powered vehicles and equipment. This equipment would also temporarily emit air pollutants. However, activities requiring the use of machinery would not be expected to be long-term. Because of the short-term and localized nature of the operation, impacts to air quality from construction activities would be minor. The area is in attainment for all criteria pollutants and under the qualifications of a Class II airshed, small increases in air emissions are allowed. Because of the localized and short-term use of construction equipment, any emissions would not be expected to exceed the NAAQS as a result of implementation of the proposed action.

While the level of traffic within the Davis Bayou Area of the park would be expected to decrease during timed VFW Road closures, the level of motor vehicle traffic in the local area and region would be expected to remain consistent. Impacts to GHG emissions would be minor. The GHG emission during construction would remain less than the 25,000 metric ton threshold.

Best management practices and mitigation measures that would be applied are the same as those identified for Alternative B in Section 7.2.9.1.3.

7.2.10.1.4 Noise

As stated under the analysis for Alternative B, for this project type, noise impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. During construction associated with road safety improvements, sounds from equipment and work crews would increase. Construction noise would not contribute substantially to long-term average noise levels, but could consist of some intrusive sounds. Noise levels from typical construction equipment such as road graders, backhoes, heavy trucks, and bulldozers range from 80 A-weighted decibels to 85 decibels at 50 ft (USDOT 2011). Noise associated with construction under Alternative C could affect residents, park users, and wildlife in the area. However, best management practices would be employed during these activities to minimize noise and the area affected under this alternative would be limited to a portion of Park Road. Sounds generated from these activities would be temporary, lasting only as long as the construction activity was occurring and would be limited to daytime working hours. During construction of traffic-calming devices, impacts to the natural soundscape would be short-term and minor.

Beyond the construction timeframe, timed closures of VFW Road would reduce the amount of traffic on Park Road at certain times of day, which could result in a long-term benefit to the natural soundscape during these closures. Otherwise, use of the park roads with the proposed improved safety features would not measurably increase sound levels from those produced currently.

7.2.10.1.5 Summary of Impacts to the Physical Environment

Impacts to the physical environment from implementation of Alternative C of the Bike and Pedestrian Use Enhancements at Davis Bayou Project would include:

- Short-term impacts to geology and substrates would be minor and adverse as a result of ground disturbance from soil removal, grading, and vegetation clearing during installation of traffic-calming medians, signs, and an automatic gate.
- Short-term impacts to hydrology, water quality, and floodplains would be associated with construction activities. Though construction in these areas may reach the elevation of groundwater, it is not likely to impact groundwater hydrology due to the larger depth of the aquifer below. Impacts to surface and groundwater water quality in this area would be minor and would result from potential erosion during construction. Impacts to the natural functioning of the floodplain would be minor as a result of a reduction of natural features in the floodplain.
- Short-term impacts to air quality and greenhouse gas emissions would be localized and minor during construction as a result of emissions produced from the use of machinery. Actions proposed under Alternative C would not be anticipated to change the level of motor vehicle traffic within the park, the local area, or the region and therefore, over the long-term, impacts to GHG emissions would be minor;
- Short-term impacts to the natural soundscape would be minor and adverse from sounds from construction of traffic-calming devices from the use of equipment and noise from construction activities. Over the long-term, timed closures of VFW Road would reduce the amount of traffic on Park Road at certain times of day, which could result in a long-term benefit to the natural soundscape during these closures.

7.2.10.2 Biological Environment

7.2.10.2.1 Living Coastal and Marine Resources

As stated under the analysis for Alternative B, for this project type, living coastal and marine resources impacts were analyzed adequately within the Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis.

Wetlands

For this project type, impacts to habitats were analyzed adequately within the PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative C, the construction of the two proposed traffic-calming medians would cause long-term adverse impacts to wetlands adjacent to the proposed project area in the Davis Bayou Area if it were determined during final design that wetlands would be filled. Impacts are expected to be minor due to the small size of the project footprint in relation to the amount of surrounding wetlands and the mitigation measures that would be in place (see the corresponding analysis section under Alternative B). Long-term, minor, adverse direct impacts are expected due to the potential loss of palustrine forested wetlands associated

with the installation of the medians. Impacts to all wetlands are discussed in greater detail in the Wetlands Statement of Findings in Appendix E.

The Trustee would apply for a Mississippi Coastal Wetland Protection Act Permit and authorization by the USACE. Pursuant to the Coastal Zone Management Act of 1972, federal activities must be consistent to the maximum extent practicable with the federally approved coastal management programs for states where the activities would affect a coastal use or resource. Federal Trustees are submitting consistency determinations for state review coincident with public review of this document. The Trustee would adhere to all conditions of the Mississippi Coastal Wetland Protection Act permit and the USACE permit.

Construction activities may affect wetlands and aquatic habitat due to erosion. The release of sediments during construction would be controlled using best management practices and mitigation as described in the corresponding analysis section under Alternative B to protect soil resources, prevent the transport of sediment into waterways, confine impacts to the construction sites, and to minimize the magnitude of the impacts on downstream water quality. Further, revegetation of disturbed sites would be started as soon as practical after work in an area is completed. Impacts are expected to be minor, short-term and adverse.

Emergent and Terrestrial Habitat

Under Alternative C, the construction of the two proposed traffic-calming medians would cause long-term adverse impacts to emergent and terrestrial habitat adjacent to the proposed project area in the Davis Bayou Area if it were determined during final design that any such habitat would be filled. Impacts are expected to be minor due to the small size of the project footprint in relation to the amount of surrounding emergent and terrestrial habitat and the mitigation measures that would be in place (see the wetlands and wildlife and wildlife habitat analysis under Alternative B). Long-term, minor, adverse direct impacts are expected due to the potential loss of habitat associated with the installation of the medians.

Construction activities may affect emergent and terrestrial habitat due to erosion. The release of sediments during construction would be controlled using best management practices and mitigation as described in the corresponding analysis section under Alternative B to protect soil resources, prevent the transport of sediment into waterways, confine impacts to the construction sites, and to minimize the magnitude of the impacts on downstream water quality. Further, revegetation of disturbed sites would be started as soon as practical after work in an area is completed.

Wildlife and Wildlife Habitat

Under Alternative C, in the short-term, construction activities would likely impact wildlife in the area due to general human disturbance, increased noise, and the potential for erosion. Project activities could result in the temporary displacement, injury, or death of wildlife. However, avoidance of the area by wildlife during construction would be anticipated and there is sufficient suitable feeding and resting habitat available in the Davis Bayou Area surrounding the project areas to support additional wildlife use. Wildlife would be expected to move away from areas of active construction and resume normal

foraging and resting behaviors. The release of sediments during construction would be controlled using best management practices and mitigation as described in the corresponding analysis section under Alternative B to protect soil resources, prevent the transport of sediment into waterways, confine impacts to the construction sites, and to minimize the magnitude of the impacts on downstream water quality. Further, revegetation of disturbed sites would be started as soon as practical after work in an area is completed. Any adverse effects would be anticipated to occur on an individual level rather than a population level. Overall, construction activities would be expected to have short-term, minor impacts on wildlife.

Under Alternative C, the construction of the two proposed traffic-calming medians would cause long-term adverse impacts to wildlife and wildlife habitat adjacent to the proposed project area in the Davis Bayou Area if it were determined during final design that any such habitat would be altered or filled. Long-term impacts to wildlife would result from a permanent loss of vegetation and the potential loss of wetlands associated with the installation of the medians. Overall, these direct impacts would be minor due to the small size of the project footprint in relation to the amount of surrounding habitat and the mitigation measures that would be in place (see the corresponding analysis section under Alternative B).

This project involves the removal of some vegetation and the placement of fill and some retaining walls along the existing road into or adjacent to areas that are currently forests, forested wetlands, and marsh. A variety of construction equipment would be used. Each of these actions and pieces of equipment serve as a potential pathway to introduce or spread invasive species. BMPs would be implemented to ensure these pathways are “broken” and do not spread or introduce species (See BMPs listed below). The implementation of these BMPs meets the spirit and intent of EO 13112. Due to the implementation of BMPs, the Trustees expect risk from invasive species introduction and spread to be short-term and minor.

Fish and Fish Habitat

Under Alternative C, increased erosion caused by construction activities could affect fish and fish habitat. The release of sediments during construction would be controlled using best management practices and mitigation, as described in the wetlands and wildlife analysis sections under Alternative B, to protect soil resources, prevent the transport of sediment into waterways, confine impacts to the construction sites, and to minimize the magnitude of the impacts on downstream water quality. Further, revegetation of disturbed sites would be started as soon as practical after work in an area is completed.

The construction of the two proposed traffic-calming medians would cause long-term adverse impacts to fish and fish habitat adjacent to the proposed project area in the Davis Bayou Area if it were determined during final design that any such habitat would be filled. It is expected that fishes that utilize the areas to be filled would be permanently displaced, and would use the other available habitats in the Davis Bayou Area. Impacts are expected to be minor due to the small size of the project footprint in relation to the amount of surrounding habitat. Impacts are expected to be realized on an individual level and not a population level. Best management practices and mitigation as described under the corresponding analysis section under Alternative B would be utilized to minimize impact to fish and fish habitat.

7.2.10.2.2 Protected Species

Through coordination with the U.S. Fish and Wildlife Service and management agencies for Mississippi, listed species were identified that may be in or near the Davis Bayou Area as described in Section 7.2.6.2.2. Information on each species, including their preferred habitat, prey, and foraging areas, was gathered. Short-term impacts would last one year or less; long-term impacts would occur for more than one year. Impacts on special status species were determined based on the same criteria as stated under Section 7.2.9.2.2 under Alternative B.

Federally listed and state-listed threatened and endangered species are addressed together in this section, because many of these species (1) have dual federal and state special status, (2) occur in the same habitats, or (3) would be impacted similarly under each alternative.

Endangered Species Act (ESA) Section 7 consultation with USFWS has been completed. The USFWS concurred that this project will have no effect to any species or critical habitat (USFWS 2015). ESA Section 7 coordination with the National Marine Fisheries Services (NMFS) concluded that there would be no effect to species and habitats under NOAA's jurisdiction (NOAA, 2015b). Appropriate recommendations would be incorporated into the proposed project.

Under Alternative C, there would be no impacts to federally listed threatened or endangered species because no currently listed threatened or endangered species are known to occur in the project area. The only species known to occur in the project corridor that is protected under the Endangered Species Act is the American alligator. The alligator is considered fully recovered from its listing as an endangered species and only remains on the threatened species list due to its similarity of appearance with the endangered crocodile. The U.S. Fish and Wildlife Service regulates the hunting and legal trade of alligator skins and products, but it no longer considers alligator populations to be imperiled (NPS 2014a).

Long-term adverse impacts would be minor and would result from the slight reduction of aquatic and terrestrial habitat associated with the installation of the medians.

Implementing Alternative C could affect the species of concern discussed in Section 7.2.6.2.2. In general, impacts to protected species from the installation of two traffic-calming medians within the first mile of Park Road would be minor due to the small size of the project footprint in relation to available habitat, the mitigation measures in place, and the ability of most of these species to avoid disturbed areas. Short-term minor impacts would be associated with the noise and disturbance of construction activities. Long-term, minor, adverse direct impacts are expected to fish and wildlife due to the permanent loss of wildlife habitat from the clearing of vegetation and the loss of wetlands.

Potential indirect, adverse impacts on protected species from the proposed action mainly would involve displacement of wildlife populations from the project area. Most wildlife would be already accustomed to traffic and visitors along the road adjacent to the project area. Movement of the limited numbers of wildlife that currently inhabit this small area into surrounding, unimpacted habitats would not be expected to result in exceedances of the carrying capacity of the extensive, adjacent habitats. Therefore, impacts would be minor.

Best management practices, along with other avoidance, mitigation, and permit conditions required by state and federal regulatory agencies would be used to minimize impacts to habitat. Mitigation measures to protect species of concern would be the same as those described above for wildlife, fish, and their habitats under the Alternative B analysis.

Bald and Golden Eagles, Migratory Birds, and Other Birds of Conservation Concern

The Trustees have reviewed the project site and determined that bald eagles do use areas near the project area for foraging and resting, but not nesting. Refer to the corresponding analysis under Alternative B for conservation measures that would be implemented for bald eagles.

The Trustees have reviewed the project site and determined that migratory bird nesting occurs in the Davis Bayou Area, but is not likely to occur within the project area. Coordination under MBTA is ongoing between the Trustees and the U.S. Fish and Wildlife Service. Pre-construction nesting surveys would be conducted; if evidence of nesting is found, coordination with the U.S. Fish and Wildlife Service would be initiated to develop and implement appropriate conservation measures.

Short-term construction activities taking place outside the nesting season would likely impact birds in the area, including protected species, due to general human disturbance and increased noise. These species are expected to move away from areas of active construction to other adjacent areas and resume normal foraging, resting, and loafing behaviors. There is sufficient suitable feeding and resting habitat available in the Davis Bayou Area surrounding the project areas to support additional bird use. In addition, conservation measures would be implemented to minimize impacts to protected species and migratory birds from the project to the maximum extent practicable (see corresponding analysis section under Alternative B). Therefore, impacts would be short-term and minor.

7.2.10.2.3 Summary of Impacts to the Biological Environment

Impacts to the biological environment from implementation of Alternative C of the Bike and Pedestrian Use Enhancements at Davis Bayou Project would include:

- Short-and long-term impacts to living coastal and marine resources would be minor and would result from the use of fill, the potential for erosion, the removal of vegetation, and the disturbance during construction activities associated with the installation of traffic-calming medians along Park Road.
- There would be no impacts to federally threatened or endangered species under Alternative C. Short-term impacts to protected species including, bald eagles, migratory birds, and other birds of concern, would be minor and adverse due to general human disturbance and increased noise during construction. Long-term impacts to protected species would be minor and adverse from displacement resulting from the permanent loss of wildlife habitat from the clearing of vegetation and the loss wetlands.

7.2.10.3 Human Uses and Socioeconomics

7.2.10.3.1 Socioeconomics and Environmental Justice

As stated under the analysis for Alternative B, for this project type, socioeconomics and environmental justice impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative C, temporary jobs would be created mainly in the construction services sector for design and completion of the proposed traffic-calming devices and increased signage along portions of Park Road. These jobs would result in a slight short-term beneficial impact to local socioeconomics from wages paid as well as an increase in sales and expenditures for local and regional services, materials, and supplies.

During road-safety improvement activities, and during temporary closures of VFW Road, some visitors could avoid the Davis Bayou Area because of perceived reductions in experience quality or due to the restricted access. A loss of these visitors and their expenditures would represent an unnoticeable impact on the economy of the county. Timed closures of VFW Road could result in an increase in road-based recreational visitation at the park during these closures, which could result in some increased spending near the park, which would have a slight long-term benefit to the local socioeconomic environment.

It is not anticipated that impacts from the installation of traffic-calming devices or timed closures of VFW Road would be any greater or more severe on minorities or individuals below the poverty line than non-minorities and those who are above the poverty line. None of the proposed actions under Alternative C would disproportionately affect low-income populations or minority populations.

Mitigation measures would be the same as those described under the corresponding analysis for Alternative B.

7.2.10.3.2 Cultural Resources

As stated under the analysis for Alternative B, for this project type, cultural resources impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative C, ground disturbance would occur in existing road corridors to accommodate the traffic calming medians. The four known archeological sites lie within or overlap areas that would include ground disturbance during construction activities proposed in Alternative C. In accordance with Section 106 of the NHPA, the National Park Service is consulting with the Mississippi SHPO. If the National Park Service determines that ground disturbance would lead to a substantial loss of important cultural information potential contained in a NRHP-eligible site, it would implement mitigation measures deemed appropriate to offset any potential loss. Such mitigation could range from documentation and curation of artifacts to creation and placement of interpretive signage and would be arrived at through consultation with the Mississippi SHPO. If previously unknown archeological resources are discovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented. If the resources could not be preserved in situ, an appropriate mitigation strategy would be developed in consultation with the SHPO and, as necessary, American Indian tribes. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are

discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001) of 1990 would be followed. If non-Indian human remains were discovered, standard reporting procedures to the proper authorities would be followed, as would all applicable federal, state, and local laws.

While the project has the potential to cause a loss of important cultural information potential, appropriate implementation of mitigations developed in consultation with the Mississippi SHPO would ensure that any adverse impacts to cultural resources under Alternative C would not exceed a minor degree of intensity. Because of their irreplaceable nature, all impacts to cultural resources are considered long-term. For purposes of NHPA Section 106, 'adverse effect to historic properties' would be the determination submitted to the Mississippi SHPO for actions associated with implementation of Alternative C should any of the four sites be determined NRHP-eligible. Should all four be determined ineligible for NRHP listing, the NHPA Section 106 determination of effects submitted to the Mississippi SHPO would be 'no historic properties affected.'

Impacts to cultural resources would be minimized using applicable mitigation measure as discussed under the corresponding Alternative B analysis.

7.2.10.3.3 Infrastructure

As stated under the analysis for Alternative B, for this project type, infrastructure impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. The addition of 10-ft elliptical traffic-calming medians within the first mile of Park Road would result in minor impacts to traffic patterns and road infrastructure by slowing traffic speeds within this area. Installing a gate at the intersection of Knapp and VFW Roads would restrict through traffic from entering the park during times of high recreational use of Park Road. This reduction of motor vehicle traffic utilizing the park roads would result in a long-term direct beneficial impact to the traffic and roadway infrastructure within the park. Long-term, indirect impacts to roadway infrastructure outside of the park would occur during the gate closures due to the increased traffic volume and potential for traffic congestion. These impacts would be minor depending on the timing of closures and the volume of traffic being directed elsewhere. No impacts to public utilities are expected under this alternative.

7.2.10.3.4 Land and Marine Management

As stated under the analysis for Alternative B, for this project type, land and marine management impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative C, a Coastal Zone Management Act consistency determination would be submitted for state review and concurrence before project implementation. No changes would occur to the current land use at the project site or the adjoining shoreline areas. The area would remain zoned for diverse visitor opportunities and land use and management authority at the Davis Bayou Area would remain under the purview of the National Park Service. Thus, no impacts would occur to land and marine management under Alternative C.

7.2.10.3.5 Aesthetics and Visual Resources

As stated under the analysis for Alternative B, for this project type, aesthetics and visual resources impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Under Alternative C, the road corridor would remain at its current width. Installing traffic-calming measures and new signage along portions of Park Road would be designed to have minimal impacts to the viewshed. Timed traffic restrictions proposed under Alternative C could result in long-term beneficial impacts to the natural landscape and soundscape through a reduction in vehicular traffic.

7.2.10.3.6 Tourism and Recreational Use

As stated under the analysis for Alternative B, for this project type, tourism and recreational use impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. During construction of the traffic-calming medians within the first mile of Park Road, recreational experience would be impacted from noise and visual disturbances associated with the use of heavy equipment. Use of Park Road in this area could be impacted by temporary closures. These temporary inconveniences would result in moderate short-term impacts on tourism and local recreational use during construction. While much of the road-based recreational use of the Davis Bayou Area comes from local residents, short-term impacts during construction would be kept slightly lower by implementing construction during the slowest part of the tourist season.

Under Alternative C, bicyclists and pedestrians would continue to traverse Robert McGhee Road and Park Road for recreational purposes and pedestrians, bicyclists, and motorists would continue to share the road surface at all times. Existing trails within the National Seashore would remain in use along their current routes. However, under this alternative, gated closures of VFW Road during high recreational use times would reduce the amount of vehicular traffic in the park during those times. Visitors would still have vehicular access to the park and its resources by accessing Park Road off U.S. Route 90. Timed gated closures of VFW Road would reduce traffic on Park Road between VFW Road and U.S. Route 90, which typically sees the most traffic congestion. This reduction of traffic would result in long-term beneficial impacts to the visitor experience for pedestrians, bicyclists, and other visitors utilizing the park for recreational purposes at those times. For visitors who were local residents utilizing Park Road as a commuter route between U.S. Route 90 and VFW Road, the timed closure would result in short-term, moderate, adverse impacts until residents adjusted to the change and found an alternate travel route. Long-term impacts would be minor and adverse.

Under this alternative, pedestrian, bicyclists, and motorists would still share the road surface at all times and there would be adverse impacts to tourism and recreational use depending on the time of day, location within the park, and level of congestion between the various user groups. Minor to moderate adverse impacts to recreational users utilizing the park roads on foot or bicycle would result from increased risks associated with sharing the road with vehicular traffic, impacts to the viewshed and natural soundscape resulting from traffic, and insecurity resulting from the proximity of vehicular traffic. With the potential for traffic in the park to increase, conditions could deteriorate to the point that the

quality of the visitor experience would be diminished for visitors that favor this area. For visitors/local residents who utilize the park roads as a commuter route, adverse impacts would result from the need to reduce driving speeds during heavy bicycle-pedestrian congestion and the increased risk associated with passing these user groups on the roads' many curves.

The addition of two traffic-calming medians within the first mile of Park Road would result in long-term benefits to the overall visitor experience by slowing traffic in this area and improving safety for both drivers and recreationalists. While residents utilizing the park roads on their daily commute may need to adjust to the traffic-calming medians, they would encourage drivers to follow the speed limit thereby improving safety and reducing traffic violations, which would result in a long-term benefit. Additional benefits would result from increased NPS road maintenance activities and compliance with appropriate Federal Highway Administration safety recommendations.

Impacts to tourism and recreational use would be minimized using applicable mitigation measures as discussed under the corresponding Alternative B analysis.

7.2.10.3.7 Public Health and Safety and Shoreline Protection

As stated under the analysis for Alternative B, for this project type, public health and safety and shoreline protection impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. No hazardous waste would be created during the installation of a traffic control gate at the intersection of Knapp and VFW Roads and traffic-calming medians along the first mile of Park Road. All hazardous materials (e.g., diesel fuels) handled during construction would be contained and appropriate barriers would be in place to ensure the protection of adjacent water resources from potential spills and leaks. Personal protective equipment would be required, as appropriate, for all construction personnel and authorized access zones would be established, if needed, at the perimeter of the project site during construction. Signage would be posted and areas deemed unsafe for the public would be temporarily closed. As a result, short-term impacts to public health and safety during installation of traffic-calming medians and a traffic control gate would be minor.

Gated closures of VFW Road during high recreational use times would reduce the amount of motorized traffic on Park Road between VFW Road and U.S. Route 90 during these peak times. While pedestrians, bicyclists, and motorists would continue to share the road surface, these timed closures would reduce motorized traffic in one of the most highly congested areas of the park during peak recreational use times. This reduction would result in long-term beneficial impacts to public health and safety for pedestrians, bicyclists, and other visitors utilizing the park for recreational purposes at those times. However, pedestrian, bicyclists, and motorists would still share the road surface at all times and there would be adverse impacts to public health and safety depending on the time of day, location within the park, and level of congestion between the various user groups. Minor to moderate adverse impacts to visitors utilizing the park roads on foot or bicycle would result from the increased risks associated with sharing the road with vehicular traffic. For visitors/local residents who utilize the park roads as a commuter route, adverse impacts would result from the increased risk associated with passing these user groups on the roads' many curves.

Emergency response vehicles would have the ability to open the gate if use of VFW Road allowed for a faster response route during an emergency. Because of this emergency accessibility, indirect impacts to public health and safety within the neighboring residential areas during closures would be minor and adverse.

The addition of two traffic-calming medians within the first mile of Park Road and a reduction in the speed limit throughout the park would result in long-term benefits to overall public health and safety by slowing traffic and improving safety for both drivers and recreationalists. Additional benefits to public health and safety would result from increased NPS road maintenance activities and compliance with appropriate Federal Highway Administration safety recommendations.

7.2.10.3.8 Summary of Impacts to the Human Uses and Socioeconomics

Impacts to the human uses and socioeconomics from implementation of Alternative C of the Bike and Pedestrian Use Enhancements at Davis Bayou Project would include:

- Short-term impacts to socioeconomics and environmental justice would be slight and beneficial as a result of the addition of temporary jobs in the area during construction;
- While the project has the potential to cause a loss of important cultural resource information, appropriate implementation of mitigations developed in consultation with the Mississippi SHPO would ensure that any adverse impacts to cultural resources under Alternative C would not exceed a minor degree of intensity;
- Short-term adverse impacts to roadway infrastructure would be minor as a result of slowing traffic speeds around the traffic-calming medians along Park Road. Long-term beneficial impacts to roadway infrastructure would result from a reduction of motor vehicle traffic resulting from timed closures at VFW Road. These impacts would be minor depending on the timing of closures and the volume of traffic being directed elsewhere. No impacts to public utilities are expected under this alternative;
- There would be no impacts to land and marine management because there would be no changes to the current land use at the project site or the adjoining shoreline areas;
- Long-term impacts to the aesthetics and visual resources within the Davis Bayou Area would be beneficial as a result of a reduction in the visual presence and noise of vehicular traffic along the park roads during timed closures;
- Short-term impacts to tourism and recreational use of the Davis Bayou Area would be moderate and adverse as a result of the temporary inconvenience from noise, the visual disturbance of heavy equipment, and temporary closures during construction. Long-term impacts to tourism and recreational use of the Davis Bayou Area would be beneficial for pedestrians, bicyclists, and other visitors utilizing the park for recreational purposes during timed closures as a result of a decrease in vehicular traffic. Long-term benefits would also result from improved safety resulting from the installation of two traffic-calming medians along Park Road. Short-term, moderate, adverse impacts to residents utilizing Park Road as a commuter route would result from timed closures of VFW Road until residents adjusted to the change and found an alternate travel route. Long-term impacts would be minor and adverse. Minor to moderate adverse

impacts to recreational users utilizing the park roads on foot or bicycle would result from increased risks associated with sharing the road with vehicular traffic, impacts to the viewshed and natural soundscape resulting from traffic, and insecurity resulting from the proximity of vehicular traffic. For visitors/local residents who utilize the park roads as a commuter route, adverse impacts would result from the need to reduce driving speeds during heavy bicycle-pedestrian congestion and the increased risk associated with passing these user groups on the roads' many curves;

- Short-term impacts to public health and safety would be minor during construction as a result of protection measures put in place to protect construction personnel and the public. Long-term impacts to public health and safety would be beneficial because of a reduction in motorized traffic during closures of VFW Road. Minor to moderate adverse impacts to visitors utilizing the park roads on foot or bicycle would result from the increased risks associated with continuing to share the road with vehicular traffic. For visitors/local residents who utilize the park roads as a commuter route, adverse impacts would result from the increased risk associated with passing these user groups on the roads' many curves.

7.2.11 Cumulative Impacts

As discussed in Chapter 4, the CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined as "the impact on the 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" (40 C.F.R. §1508.7).

The Bike and Pedestrian Use Enhancement Project cumulative impacts analysis tiers from the Phase III ERP/PEIS analysis of the Alternative "Contribute to Providing and Enhancing Recreational Opportunities." That analysis included an evaluation of the type of restoration activity proposed for the Bike and Pedestrian Use Enhancement project. The Final Phase III ERP/PEIS identified nine major action categories, as well as examples of past, present, and reasonably foreseeable future actions in the study area. The categories of potentially relevant past, present, and reasonably foreseeable future actions included: Restoration related to the Spill, other relevant environmental stewardship and restoration activities, military operations, marine transportation, energy activities, marine mineral mining, including sand and gravel mining, coastal development and land use, fisheries and aquaculture, and tourism and recreation.

The Phase III ERP/PEIS analysis of cumulative impacts relevant to the proposed project is incorporated by reference into the following cumulative impacts analysis for the Bike and Pedestrian Use Enhancement project. The following analysis focuses on the cumulative impacts of other past, present, and reasonably foreseeable future actions not already analyzed in the Phase III ERP/PEIS and the Bike and Pedestrian Use Enhancement project itself. The contribution that the proposed project makes to the cumulative impacts is then stated.

7.2.11.1 Site Specific Review and Analysis of Cumulative Impacts

This section describes past, present, and reasonably foreseeable future actions that were not discussed in the Phase III ERP/PEIS, but which are relevant to identifying any cumulative impacts that the proposed Bike and Pedestrian Use Enhancement Project could contribute to on a local scale. Context and intensity, terms defined in Appendix D, are used in the analysis.

For the Bike and Pedestrian Use Enhancement project, specifically, the relevant affected resources analyzed in this EA are:

- Geology and Substrates
- Hydrology, Water Quality, and Floodplains
- Air Quality and Greenhouse Gas Emissions
- Noise
- Living Coastal and Marine Resources
- Protected Species
- Socioeconomics and Environmental Justice
- Cultural Resources
- Infrastructure
- Land and Marine Management
- Aesthetics and Visual Resources
- Tourism and Recreational Use
- Public Health and Safety and Shoreline Protection

Past, present and reasonably foreseeable future actions not analyzed in the Phase III ERP/PEIS local action types were identified through conversations with Seashore staff and searching websites relevant to the project. Actions that would be relevant to the Bike and Pedestrian Use Enhancement Project cumulative impacts analysis are defined here as those with similar timing or location, and that affect similar resources. The site-specific area is defined as the study area corridor in the Davis Bayou Area; however, this cumulative impacts analysis includes areas adjacent to the Davis Bayou Area, where appropriate. Websites searched include:

- http://www.nfwf.org/whoweare/mediacenter/pr/Pages/gulf-main-pr-14-1117.aspx
- http://eli-ocean.org/gulf/restoration-projects-database/

This search, in addition to conversation with Seashore staff, resulted in the following three actions that are relevant to the Bike and Pedestrian Use Enhancement Project cumulative impacts analysis.

Table 7-8. Description of past, present, and reasonably foreseeable future actions not identified in the PEIS

Category/Projects	Project Description	Key Resource Areas with Potential for Cumulative Impacts
1. General Management and Resource Management Plans at Gulf Islands National Seashore	These management plans structure operations and management of the national seashore and its resources. These plans include, for example, the Fire Management Plan and the General Management Plan. Each plan prescribes ongoing management actions and the implementation of discreet projects.	• Geology and substrates • Hydrology, water quality, and floodplains • Noise • Protected Species • Tourism and Recreational Use • Cultural Resources • Air quality and greenhouse gas emissions • Living coastal and marine resources • Protected species • Socioeconomic and environmental justice • Land and marine management • Aesthetics and visual resources • Public health and safety and shoreline protection
2. Expansion of facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi	Access to the campus is only available via Park Road. The new facilities and programs are expected to increase vehicular traffic along Park Road and bring more visitors to the Davis Bayou Area.	• Geology and substrates • Noise • Protected Species • Hydrology, water quality, and floodplains • Living coastal and marine resources • Aesthetics and visual resources • Infrastructure • Tourism and Recreational Use • Socioeconomic and environmental justice
3. Utility Infrastructure Improvements	The national seashore anticipates the installation of fiber optic utility lines in the near future. The electrical company is planning to replace the electrical utility lines along Park Road within the foreseeable future. Both of these utility lines would be buried.	• Geology and substrates • Noise • Tourism and Recreational Use • Aesthetics and visual resources • Infrastructure

Other Phase IV Restoration Projects are not anticipated to represent cumulative actions with respect to this project.

7.2.11.1.1 Geology and Substrates

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.1 Geology and Substrates, Table 6-4. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to geology and substrates would likely occur. However, those types of projects carried out in conjunction with other environmental stewardship and restoration efforts have the potential to result in some long-term beneficial cumulative impacts to geology and

substrates in localized areas. Those types of projects were not expected to contribute substantially to cumulative adverse impacts. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified cumulative impacts that could occur under each of the alternatives (A, B, and C) considered for the Bike and Pedestrian Use Enhancements at Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-8 above, include: 1) Impacts on geology and substrates which would result from recreational improvements and other planning efforts within the Davis Bayou Area of the national seashore. Natural resource management plans within the national seashore would alter conditions during implementation from increased erosion and displacement of soil, which could result in short-term adverse impacts ranging from minor to moderate depending on the action. However, over the long-term these plans protect natural resources, which would result in long-term benefits to geology and substrates. 2) An expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi, which would result in short-term minor, adverse impacts to geology and substrates in the vicinity of the Davis Bayou Area from increased erosion and displacement of soil during construction. 3) Installation of new utilities along Park Road, which would result in short-term minor, adverse impacts to geology and substrates in the Davis Bayou Area during construction that may displace soil or require soil removal and fill placement.

Under Alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would have minor adverse impacts on geology and substrates. Alternative A carried out in conjunction with the other plans and actions discussed in Table 7-8 has the potential to result in short-term minor to moderate adverse impacts and long-term beneficial cumulative impacts to geology and substrates discussed above. Alternative A would not be expected to contribute substantially to these cumulative adverse impacts.

Under Alternative B, the Bike and Pedestrian Use Enhancements at Davis Bayou project would have a minor to moderate, adverse, and short- to long-term impact on geology and substrates. Alternative B carried out in conjunction with other plans and actions discussed above has the potential to result in some short-term minor to moderate adverse, long-term minor adverse, and long term beneficial cumulative impacts to geology and substrates. Alternative B would have a small contribution to these cumulative adverse impacts.

Under Alternative C, the Bike and Pedestrian Use Enhancements at Davis Bayou project would have short-term, minor, and adverse impacts on geology and substrates. Alternative C carried out in conjunction with the other plans and actions discussed above has the potential to result in short-term minor to moderate adverse impacts and long-term beneficial cumulative impacts to geology and substrates. Alternative C would not be expected to contribute substantially to these cumulative adverse impacts.

7.2.11.1.2 Hydrology, Water Quality, and Floodplains

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.2 Geology and Substrates, Table 6-5. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts on hydrology and water quality would likely occur. However, those types of projects carried out in conjunction with other environmental stewardship and restoration efforts have the potential to result in some long-term beneficial cumulative impacts on water quality in localized areas. Those types of projects were not expected to contribute substantially to cumulative adverse impacts. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified two actions as being potentially relevant to the Bike and Pedestrian Use Enhancements at Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-8 above, include: 1) Cumulative impacts on hydrology, water quality, and floodplains which would result from management plans within the Davis Bayou Area of the national seashore, including the General Management Plan, the Fire Management Plan and Invasive Species Management Plan. These plans involve the use of chemical controls, which have the potential to enter the water bodies within the park in the case of mishandling of chemicals or an actual fire requiring retardants. These chemicals could have short- or long-term impacts on water quality depending on the flush-time of the water body. However, with best management practices in place these impacts are expected to be minor. The variety of improvements proposed under the 2013 *Gulf Islands National Seashore General Management Plan*, could have a moderate, long-term, beneficial impact on water quality within the Davis Bayou Area by decreasing erosion and the potential for pollutants to enter water bodies within the park. Implementation of other natural resource management plans within the national seashore, including the fire management plan and the invasive species management plan, have the potential to alter surface and ground water quality as well as floodplain function due to increased sedimentation from erosion and displacement of soils during implementation. However, over the long-term proposed actions under these plans have been developed to protect the overall ecosystem, which would result in long-term benefits to hydrology, water quality, and floodplains. 2) An expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi, which would result in short-term and adverse impacts on hydrology, water quality, and possibly floodplains of the Davis Bayou Area due to increased sedimentation in the water bodies from erosion during construction. However, with best management practices in place, these impacts are expected to be minor.

Under Alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would result in no impacts on the hydrology, water quality, or floodplains. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some minor short- to long-term adverse and long-term beneficial cumulative impacts on hydrology, water quality, and floodplains. Alternative A would not be expected to contribute substantially to cumulative adverse impacts.

Under Alternative B of the Bike and Pedestrian Use Enhancements at Davis Bayou project, impacts on groundwater hydrology would be moderate long-term adverse and also long-term beneficial; impacts on surface and groundwater water quality would be minor and adverse, but temporary and also long-term beneficial; and impacts on the natural functioning of the floodplain would be minor and adverse. Alternative B carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor short- to long-term adverse and long-term beneficial impacts on surface and groundwater water quality and the natural functioning of the floodplain. Alternative B would have a small contribution to cumulative adverse impacts.

Under Alternative C of the Bike and Pedestrian Use Enhancements at Davis Bayou project, impacts on groundwater hydrology are not likely; impacts on surface and groundwater water quality would be minor and adverse, but temporary; and impacts on the natural functioning of the floodplain would be minor and adverse. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor short-to long-term adverse and long-term beneficial impacts on surface and groundwater water quality and the natural functioning of the floodplain. Alternative C would not be expected to contribute substantially to cumulative adverse impacts.

7.2.11.1.3 Air Quality and Greenhouse Gases

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.3 Air Quality, Table 6-4. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to air quality and greenhouse gas emissions would likely occur. However, those types of projects carried out in conjunction with other environmental stewardship and restoration efforts have the potential to result in some long-term beneficial cumulative impacts to air quality and greenhouse gas emissions in localized areas. Those types of projects were not expected to contribute substantially to cumulative adverse impacts. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified three actions as being potentially relevant to the Bike and Pedestrian Use Enhancements at Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-8 above, include: 1) Cumulative impacts on air quality and greenhouse gases which would result from recreational improvements and other planning efforts within the Davis Bayou Area of the national seashore. Natural resource management plans within the national seashore would alter conditions, with short-term adverse impacts to air quality and greenhouse gas emissions from the use of mechanized equipment during implementation. However, over the long-term these plans all follow NPS management directives to protect air quality, which would result in long-term benefits. 2) An expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi, which would increase vehicular traffic along Park Road, increasing emissions in the area and resulting in minor, long-term, and adverse impacts. 3) Installation of new utilities along Park Road, which

would result in short-term minor, adverse impacts from equipment emissions in the Davis Bayou Area during construction.

Under Alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would have long-term adverse impacts on air quality and greenhouse gas emissions. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in short- and long-term minor adverse and long-term beneficial cumulative impacts to air quality and greenhouse gas emissions. Alternative A would not be expected to contribute substantially to cumulative adverse impacts.

Under Alternative B, the Bike and Pedestrian Use Enhancements at Davis Bayou project would have a slight, adverse, and short-term impact on air quality and greenhouse gas emissions. Alternative B carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor short- and long-term adverse and long-term beneficial cumulative impacts to air quality and greenhouse gas emissions. Alternative B would not be expected to contribute substantially to cumulative adverse impacts.

Under Alternative C, the Bike and Pedestrian Use Enhancements at Davis Bayou project would have minor, adverse, and short-term impacts on air quality and greenhouse gas emissions. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor short- and long-term adverse and long-term beneficial cumulative impacts to air quality and greenhouse gas emissions. Alternative C would not be expected to contribute substantially to cumulative adverse impacts.

7.2.11.1.4 Noise

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.4 Noise, Table 6-4. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to noise would likely occur. However, those types of projects carried out in conjunction with other environmental stewardship and restoration efforts have the potential to result in some long-term beneficial cumulative impacts to noise in localized areas. Those types of projects were not expected to contribute substantially to cumulative adverse impacts. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified three actions as being potentially relevant to the Bike and Pedestrian Use Enhancements at Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-8 above, include: 1) Cumulative impacts on noise which would result from an increase in noise associated with implementation of recreational improvements, resource management, and other planning efforts within the Davis Bayou Area of the national seashore. Implementation of these actions would result in short-term adverse impacts on noise from the use of mechanized machinery during implementation. However, over the long-term these plans all follow NPS management directives to protect natural

soundscapes, which would result in long-term benefits. 2) An expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi , which would increase vehicular traffic along Park Road increasing noise in the area and resulting in minor, long-term, and adverse impacts. 3) Installation of new utilities along Park Road, which would result in short-term minor, adverse impacts from increased noise and the possibility for intrusive sounds in the Davis Bayou Area during construction.

Under Alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would have long-term, minor, and adverse impacts on noise. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some minor short- and long-term adverse and long-term beneficial cumulative impacts to noise. Alternative A would not be expected to contribute substantially to cumulative adverse impacts.

Under Alternative B, the Bike and Pedestrian Use Enhancements at Davis Bayou project would have a minor to moderate, adverse, and short-term impact on noise. Alternative B carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some minor to moderate short- and long-term adverse and long-term beneficial cumulative impacts to noise. Alternative B would have a small contribution to cumulative adverse impacts.

Under Alternative C, the Bike and Pedestrian Use Enhancements at Davis Bayou project would have short-term, minor, and adverse impacts on noise. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some minor short- and long-term adverse and long-term beneficial cumulative impacts to geology and substrates. Alternative C would not be expected to contribute substantially to cumulative adverse impacts.

7.2.11.1.5 Living Coastal and Marine Resources

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.2.2 Living Coastal and Marine Resources, Table 6-9. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to living coastal and marine resources would likely occur. However, those types of projects carried out in conjunction with other environmental stewardship and restoration efforts have the potential to result in some long-term beneficial cumulative impacts to living coastal and marine resources, primarily as a result of increased education and awareness of resources and reef development. Those types of projects were not expected to contribute substantially to cumulative adverse impacts. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified two actions as being potentially relevant to the Bike and Pedestrian Use Enhancements at Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-8 above, include: 1) Cumulative impacts to living coastal and marine resources which would result from recreational improvements and other planning efforts within the Davis Bayou Area of the national

seashore. The variety of biological management, resource protection actions, and enhanced scientific study and research proposed under the 2013 *Gulf Islands National Seashore General Management Plan* would increase awareness and management of these resources, which would increase protection and have a moderate, long-term, beneficial impact on the living coastal and marine resources in the project area. Implementation of other natural resource management plans within the national seashore, including the fire management plan and the invasive species management plan, would alter conditions, with short-term minor adverse impacts from ground disturbance during implementation. However, over the long-term, actions proposed under these plans protect natural habitats and species diversity and thereby improve vegetation and wildlife habitat, which would result in long-term benefits to living coastal and marine resources. 2) An expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi, which would increase visitor use in the Davis Bayou Area and would increase vehicular traffic along Park Road. During these times of increased use and traffic, impacts to living coastal and marine resources could be minor and adverse depending on the time of day, time of year, and the level of congestion.

Under Alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would result in extremely small long-term adverse impacts to the living coastal and marine resources. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some minor short-term adverse and long-term beneficial cumulative impacts to living coastal and marine resources. Alternative A would not be expected to contribute substantially to cumulative adverse impacts.

Under Alternative B, the Bike and Pedestrian Use Enhancements at Davis Bayou project would result in short- and long-term, minor, and adverse impacts to living coastal and marine resources. There would be long-term beneficial impacts to wetlands and EFH from mitigation projects. Alternative B carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some minor short- and long-term adverse and long-term beneficial cumulative impacts to living coastal and marine resources. Alternative B would have a small contribution to cumulative adverse impacts.

Under Alternative C, impacts from the Bike and Pedestrian Use Enhancements at Davis Bayou project would be short- and long-term, direct and indirect, minor, and adverse. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some short- and long-term minor adverse and long-term beneficial cumulative impacts to living coastal and marine resources. Alternative C would not be expected to contribute substantially to cumulative adverse impacts.

7.2.11.1.6 Protected Species

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.2.1 Habitats, Table 6-8. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to habitat would likely occur. However, those types of projects carried out

in conjunction with other environmental stewardship and restoration efforts have the potential to result in some long-term beneficial cumulative impacts to habitat in localized areas. Those types of projects were not expected to contribute substantially to cumulative adverse impacts. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified two actions as being potentially relevant to the Bike and Pedestrian Use Enhancements at Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-8 above, include: 1) Cumulative impacts to protected species, which would result from recreational improvements and other planning efforts within the Davis Bayou Area of the national seashore. The variety of biological management, resource protection actions, and enhanced scientific study and research proposed under the 2013 *Gulf Islands National Seashore General Management Plan* would increase awareness of and protection for protected species and thereby have a moderate, long-term, beneficial impact on protected species in the area. Implementation of other natural resource management plans within the national seashore, including the fire management plan and the invasive species management plan, would alter conditions, with short-term adverse impacts on protected species resulting from ground disturbance and the use of mechanized equipment during implementation. However, over the long-term actions proposed under these plans protect natural habitats and species diversity and thereby improve vegetation and wildlife habitat, which would result in long-term benefits to protected species. 2) An expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi would disturb nearby habitat, increase visitor use and potential disturbance to protected species in the Davis Bayou Area, and would increase vehicular traffic along Park Road. During these times of increased use and traffic, there is the potential for increased collisions or interactions with protected species and over the long-term impacts could be minor and adverse depending on the time of day, time of year, and the level of congestion.

Under Alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would result in extremely small long-term adverse impacts to protected species. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some minor, short- and long-term adverse and long-term beneficial cumulative impacts to protected species. Alternative A would not be expected to contribute substantially to cumulative adverse impacts.

Under Alternative B, impacts from the Bike and Pedestrian Use Enhancements at Davis Bayou project to protected species would be short- and long-term, minor, and adverse. Alternative B carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some minor, short- and long-term adverse and long-term beneficial cumulative impacts to protected species. Alternative B would not be expected to contribute substantially to cumulative adverse impacts.

Under Alternative C, impacts from the Bike and Pedestrian Use Enhancements at Davis Bayou project would be short- and long-term, direct and indirect, minor, and adverse. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to

result in some minor, short- and long-term adverse and long-term beneficial cumulative impacts to protected species. Alternative C would not be expected to contribute substantially to cumulative adverse impacts.

7.2.11.1.7 Socioeconomics and Environmental Justice

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.1 Socioeconomics and Environmental Justice, Table 6-4. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to socioeconomics and environmental justice would likely occur. However, those types of projects carried out in conjunction with other environmental stewardship and restoration efforts have the potential to result in some long-term beneficial cumulative impacts to noise in localized areas. Those types of projects were not expected to contribute substantially to cumulative adverse impacts. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified three actions as being potentially relevant to the Bike and Pedestrian Use Enhancements at Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-8 above, include: 1) Cumulative impacts on socioeconomics and environmental justice, which would result from recreational improvements and other planning efforts within the Davis Bayou Area of the national seashore. The variety of recreational opportunities and planning projects proposed under the 2013 *Gulf Islands National Seashore General Management Plan*, along with increased spending for improvements and increased visitor use, could boost the local economy and have a moderate, long-term, beneficial impact on socioeconomics and environmental justice. Implementation of other natural resource management plans within the national seashore would alter conditions, with short-term adverse impacts to socioeconomics and environmental justice if areas are closed or restricted. 2) An expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi, which would increase vehicular traffic along Park Road resulting in minor, short-term, and beneficial impacts to socioeconomics and environmental justice from construction spending. 3) Installation of new utilities along Park Road, which would result in short-term minor, beneficial impacts from increased construction spending in the Davis Bayou Area.

Under Alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would have no impacts to socioeconomics and environmental justice. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor, short-term adverse and short and long-term beneficial cumulative impacts to socioeconomics and environmental justice. Alternative A would not be expected to contribute substantially to cumulative adverse impacts.

Under Alternative B, there would be slight short- and long-term beneficial impacts to socioeconomics and environmental justice. Alternative B carried out in conjunction with other plans and actions within

and around the Davis Bayou Area has the potential to result in minor, short-term adverse and short- and long-term beneficial cumulative impacts to socioeconomics and environmental justice. Alternative B would have a small contribution to cumulative adverse impacts.

Under Alternative C, there would be slight, short-term, beneficial impacts on socioeconomics and environmental justice. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor, short-term adverse, and short- and long-term beneficial cumulative impacts to socioeconomics and environmental justice. Alternative C would not be expected to contribute substantially to cumulative adverse impacts.

7.2.11.1.8 Cultural Resources

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.2 Cultural Resources, Table 6-11. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, those types of projects are not expected to contribute substantially to short-term or long-term adverse or beneficial cumulative impacts to cultural resources. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified three actions as being potentially relevant to the Bike and Pedestrian Use Enhancements at Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts organized by the action mentioned in Table 7-8 above include: 1) Cumulative impacts on cultural resources would result from implementation of plans and projects within the Davis Bayou Area of the national seashore. The establishment of a cultural resources management program proposed under the 2013 Gulf Islands National Seashore General Management Plan is expected to result in identification and documentation of additional cultural resources within the national seashore, as well as development of preservation strategies. This would increase protection of these resources and result in a moderate, long-term beneficial impact. 2) Proposed expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi and installation of new utilities along Park Road would each include archeological surveys or monitoring, as appropriate, preceding all ground disturbing activities. Because archeological resources would be identified and avoided to the greatest extent possible during construction, and because appropriate mitigation measures would be implemented by the National Park Service if necessary, any adverse impacts to archeological resources associated with these two future projects would be no more than minor.

Under alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would result in no impacts to cultural resources. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in both minor adverse and long-term beneficial cumulative impacts to cultural resources. Alternative A would not contribute to these cumulative impacts.

Under alternative B, adverse impacts to cultural resources may occur under the Bike and Pedestrian Use Enhancements at Davis Bayou project because known archeological resources would be disturbed during construction activities. However, any substantial loss of important cultural information potential and/or encounters with previously undiscovered resources would be subject to established mitigation measures to ensure that adverse impacts are no greater than minor. Alternative B carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in both minor adverse and long-term beneficial cumulative impacts to cultural resources. Alternative B would not contribute substantially to these cumulative impacts.

Under alternative C, adverse impacts to cultural resources may occur under the Bike and Pedestrian Use Enhancements at Davis Bayou project because known archeological resources would be disturbed during construction activities. However, any substantial loss of important cultural information potential and/or encounters with previously undiscovered resources would be subject to established mitigation measures to ensure that adverse impacts are no greater than minor. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in both minor adverse and long-term beneficial cumulative impacts to cultural resources. Alternative C would not contribute substantially to these cumulative impacts.

7.2.11.1.9 Infrastructure

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.3 Infrastructure, Table 6-12. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, those types of projects would not be expected to result in a substantial incremental contribution to cumulative adverse impacts to infrastructure, though infrastructure would likely be affected by ongoing and future activities requiring future investment. Those types of projects may contribute to some long-term beneficial cumulative impacts to water quality in localized areas. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified two actions as being potentially relevant to infrastructure under the Bike and Pedestrian Use Enhancements at Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-8 above, include: 2) Cumulative impacts on infrastructure which would result from an expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi, which would increase vehicular traffic along Park Road. Depending on the amount of increased traffic, the increased wear and tear would result in long-term, minor to moderate adverse impacts to the roadways along the portion of Park Road between U.S. Route 90 and the lab entrance. 3) Installation of new utilities along Park Road could result in a temporary disturbance to services and/or changes to the roadway surface from installation. These actions would result in short-term minor, adverse impacts to public utilities within the Davis Bayou area during construction. However, improved public utilities would result in long-term beneficial impacts to infrastructure.

Under Alternative A, continued use of infrastructure would result in long-term, minor adverse impacts. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor short-term adverse, minor to moderate long-term adverse, and long-term beneficial cumulative impacts to infrastructure. Alternative A would not be expected to contribute substantially to adverse cumulative impacts.

Under Alternative B, there would be short-term, minor to moderate adverse impacts to roadways and public utilities and long-term beneficial impacts to infrastructure. Alternative B carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some minor to moderate short- and long-term adverse and long-term beneficial cumulative impacts to infrastructure. Alternative B would have a large contribution to both the short-term adverse and the long-term beneficial cumulative impacts.

Under Alternative C, there would be long-term, beneficial impacts to roadways and no impacts to public utilities. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor short-term adverse, minor to moderate long-term adverse, and long-term beneficial impacts to infrastructure. Depending on the timing of congestion associated with the Gulf Coast Research Laboratory and that of timed closures of VFW Road, there is the potential for increased long-term adverse impacts to infrastructure both inside the national seashore and immediately outside as a result of increased congestion. Alternative C would have a small contribution to both the short-term adverse and the long-term beneficial cumulative impacts.

7.2.11.1.10 Land and Marine Management

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.4 Land and Marine Management, Table 6-13. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, those types of projects would not contribute substantially to short-term or long-term cumulative adverse impacts to land and marine management. However, those types of projects carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to land and marine management in the Gulf Coast region because of the potential for synergistic effects of those project types with these other environmental stewardship and restoration activities leading to the alignment of management goals and assistance provided to management and staff to best manage properties from restoration, conservation and recovery efforts. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified one action as being potentially relevant to the Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-7 above, include: 1) Cumulative impacts on land and marine management would result from recreational improvements and other planning efforts within the Davis Bayou Area of the national seashore. The decision, under the 2013 *Gulf Islands National Seashore General Management Plan,* not to maintain the recreational playing fields within the Davis

Bayou Area could have a slight impact on land management of this portion of the national seashore, but because the area would still be used for recreational purposes, overall there would be no changes to the land use of the area. Other natural resource management plans within the national seashore would not impact land and marine management.

No changes would occur to the current land use at the project site or the adjoining shoreline areas under any of the proposed alternatives for the Bike and Pedestrian Use Enhancements at Davis Bayou project. The area would remain zoned for diverse visitor opportunities and land use and management authority at the Davis Bayou Area would remain under the purview of the national seashore. Thus, no impacts would occur to land and marine management under Alternatives A, B, or C. Alternatives A, B, and C carried out in conjunction with other plans and actions within and around the Davis Bayou Area would not result in impacts to land and marine.

Based on these findings, the Bike and Pedestrian Use Enhancements at Davis Bayou project is not expected to contribute substantially to cumulative impacts to land and marine management.

7.2.11.1.11 Aesthetics and Visual Resources

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.8 Aesthetics and Visual Resources, Table 6-17. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to aesthetics and visual resources would likely occur. However, those types of projects carried out in conjunction with other environmental stewardship and restoration efforts have the potential to result in some long-term beneficial cumulative impacts to aesthetics and visual resources in localized areas. Those types of projects would not contribute substantially to cumulative adverse impacts. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified three actions as being potentially relevant to the Bike and Pedestrian Use Enhancements at Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. 1) Cumulative impacts on aesthetics and visual resources, which would result from implementation of plans and projects within the Davis Bayou Area of the national seashore. The 2013 *Gulf Islands National Seashore General Management Plan*, as well as natural resource management plans (invasive plant management and fire management plans), are expected to result in improved natural habitats within the national seashore, which would be considered aesthetically pleasing and would constitute a long-term, beneficial impact on aesthetics and visual resources. 2) Proposed expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi could increase traffic congestion within the national seashore. The presence of increased traffic would result in a long-term, minor, adverse impact to aesthetics and visual resources. 3) Installation of new utilities along Park Road would involve the temporary presence of construction crews and machinery, a short-term, minor adverse impact to aesthetics and visual resources.

Under Alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would result in long-term minor adverse impact to aesthetics and visual resources. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in short- and long-term minor adverse, and long-term beneficial cumulative impacts to aesthetics and visual resources. Alternative A would have a small contribution to cumulative adverse impacts.

Under Alternative B, both short- and long-term, minor adverse impacts to aesthetics and visual resources would result from the Bike and Pedestrian Use Enhancements at Davis Bayou project. Alternative B carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in short- and long-term minor adverse, and long-term impacts to aesthetics and visual resources. Alternative B would have a small contribution to cumulative adverse impacts.

Under Alternative C, minimal adverse impacts would occur along with long-term, beneficial impacts from the Bike and Pedestrian Use Enhancements at Davis Bayou project. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in short- and long-term minor adverse, and long-term beneficial cumulative impacts to aesthetics and visual resources. Alternative C would have a small contribution to both the adverse and beneficial cumulative impacts.

7.2.11.1.12 Tourism and Recreational Use

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.5 Tourism and Recreational Use, Table 6-14. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to tourism and recreational use would likely occur. However, those types of projects carried out in conjunction with other environmental stewardship and restoration efforts have the potential to result in some long-term beneficial cumulative impacts to tourism and recreational use in localized areas. Those types of projects would not contribute substantially to cumulative adverse impacts. In this manner, the Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified three actions as being potentially relevant to the Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-8 above, include: 1) Cumulative impacts on tourism and recreational use, which would result from recreational improvements and other planning efforts within the Davis Bayou Area of the national seashore. The variety of recreational opportunities proposed under the 2013 *Gulf Islands National Seashore General Management Plan*, along with an increased emphasis and number of facilities to support the education, interpretation, and stewardship activities for visitors could have a moderate, long-term, beneficial impact on the visitor experience. Other natural resource management plans within the national seashore would alter conditions, with short-term adverse impacts on visitor experience during implementation due to temporary closures or

disruptions. However, over the long-term these plans protect natural habitats and species diversity and thereby improve opportunities for wildlife observation and aesthetic resources, which would result in long-term benefits to tourism and recreational use. 2) An expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi would increase vehicular traffic along Park Road. During these times of increased traffic, long-term impacts to tourism and recreational use could be moderate and adverse depending on the time of day, time of year, and the level of congestion. The increased access and availability of these programs for visitors to the Davis Bayou Area of the national seashore would result in long-term beneficial impacts. 3) Installation of new utilities along Park Road would result in short-term minor, adverse impacts to tourism and recreational use of the Davis Bayou Area during construction. However, improved utility infrastructure would result in long-term beneficial impacts to visitors.

Under Alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would result in long-term, minor to moderate adverse impacts. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor short-term and up to moderate long-term adverse and long-term beneficial cumulative impacts to tourism and recreational use. Alternative A would have a small contribution to cumulative adverse impacts.

Under Alternative B, impacts to tourism and recreational use would be short-term, moderate and adverse during construction and beneficial over the long term from the Bike and Pedestrian Use Enhancements at Davis Bayou project. Alternative B carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor to moderate short- and long-term adverse and long-term beneficial cumulative impacts to tourism and recreational use. Alternative B would have a large contribution to both short-term adverse and long-term beneficial cumulative impacts.

Under Alternative C, the Bike and Pedestrian Use Enhancements at Davis Bayou project would result in short- and long-term, minor to moderate adverse impacts with some long-term benefits. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in minor to moderate short- and long-term adverse and long-term beneficial impacts, and some substantial long-term adverse cumulative impacts to tourism and recreational use depending on whether peak congestion to the Gulf Coast Research Laboratory coincided with timed closures of VFW Road. Alternative C would have a small contribution to both short-term adverse and long-term beneficial cumulative impacts.

7.2.11.1.13 Public Health and Safety and Shoreline Protection

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.9 Public Health and Safety, Including Flood and Shoreline Protection, Table 6-18. As stated there, when projects that 'Contribute to Providing and Enhancing Recreational Opportunities' were analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to public health and safety would likely occur. However, those types of projects carried out in conjunction with other environmental stewardship and restoration efforts have the potential to result in some long-term

beneficial cumulative impacts to public health and safety in localized areas. Those types of projects would not contribute substantially to cumulative adverse impacts. The Bike and Pedestrian Use Enhancements at Davis Bayou project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

On a local scale, this analysis identified three actions as being potentially relevant to the Davis Bayou project that were not identified in the Phase III ERP/PEIS due to their localized nature. These cumulative impacts, organized by the action mentioned in Table 7-8 above, include: 1) Cumulative impacts on public health and safety which would result from improvements and other planning efforts within the Davis Bayou Area of the national seashore. Natural resource management plans and visitor-based improvements proposed under the 2013 *Gulf Islands National Seashore General Management Plan* would have a long-term beneficial impact on public health and safety by improving facilities and providing for safe management of resources. 2) An expansion of the facilities and programs at the Gulf Coast Research Laboratory of the University of Southern Mississippi would increase vehicular traffic along Park Road. During these times of increased traffic, impacts to public health and safety could be moderate and adverse depending on the time of day, time of year, and the level of congestion. 3) Installation of new utilities along Park Road would result in short-term adverse impacts to public health and safety during construction. However, these impacts would be minor in intensity due to implementation of safety precautions during construction.

Under Alternative A, the Bike and Pedestrian Use Enhancements at Davis Bayou project would result in long-term, minor to moderate adverse impacts. Alternative A carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in short- and long-term minor to moderate adverse and long-term beneficial cumulative impacts to public health and safety. Alternative A would have a fairly large contribution to cumulative adverse impacts.

Under Alternative B, impacts to public health and safety under the Bike and Pedestrian Use Enhancements at Davis Bayou project would be minor and adverse during construction and beneficial over the long term. Alternative B carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in short-and long-term minor to moderate adverse and long-term beneficial cumulative impacts to public health and safety. Alternative B would have a large contribution to cumulative beneficial impacts.

Under Alternative C, the Bike and Pedestrian Use Enhancements at Davis Bayou project would result in short- and long-term, minor to moderate adverse impacts with some long-term benefits. Alternative C carried out in conjunction with other plans and actions within and around the Davis Bayou Area has the potential to result in some substantial long-term adverse cumulative impacts to public health and safety depending on whether peak congestion to the Gulf Coast Research Laboratory coincided with timed closures of VFW Road. Collectively, cumulative impacts would be short- and long-term, minor to moderate adverse and long-term beneficial. Alternative C would have a small contribution to cumulative adverse impacts.

7.2.12 Summary and Next Steps

The proposed bicyclist and pedestrian use enhancements on Park Road (2.17 miles) and Robert McGhee Road (0.82 miles) in the Davis Bayou Area under either action alternative would improve the experience of bicyclists and pedestrians there. The Preferred Alternative (Alternative B) involves adding a multiple-use lane on the sides of the road. Alternative C involves installing a traffic control gate at VFW and Knapp road to restrict traffic through the park at different times of the day. Both action alternatives involve adding two traffic-calming structures in the median of Park Road. The existing condition (Alternative A) poses a safety risk to pedestrians and cyclists and does not meet the purpose and need of the project. This project is consistent with the 'Contribute to Providing and Enhancing Recreational Opportunities' Alternative in the Phase III ERP/PEIS for early restoration. Although this EA addresses the project as it would occur on both Park Road and McGhee Road, the Phase IV early restoration project funds only the Park Road portion.

The Draft NEPA analysis of the environmental consequences suggests that of the impacts caused by the project's Preferred Alternative, most would be minor, adverse and short-term, some would be moderate, adverse and short-term, a few would be minor or moderate, adverse and long-term, and some – especially for Infrastructure, Tourism and Recreational Use, and Public Health and Safety – would be long-term and beneficial. No major adverse impacts are anticipated.

The Trustees have started coordination and reviews under the Historic Preservation Act and other federal statutes. Coordination and informal consultation under the ESA, MBTA, and BGEPA have been completed. The USFWS concurred that this project will have no effect to any species or critical habitat and that take of migratory birds and bald eagles will be avoided (USFWS 2015). The consultations for both ESA and MSFCMA are complete. For ESA compliance, NOAA determined that this project selected for implementation in Phase IV of the DWH Early Restoration Plan will have No Effect to listed species under the jurisdiction of National Marine Fisheries Service. For MSFCMA compliance, NOAA concurs that an adequate evaluation of potential project impacts to EFH supportive of a number of federally managed fishery species has been provided to NOAA (NOAA 2015a). In addition, sufficient information pertaining to the marsh-creation mitigation component of the project to ensure impacts to EFH would be adequately offset was provided. The Trustees have completed coordination and reviews with NOAA under the Marine Mammal Protection Act. Pursuant to the Coastal Zone Management Act of 1972, the Federal Trustees submitted their consistency determination for this project to the Mississippi DMR on May 21, 2015. The Mississippi DMR replied by letter dated June 29, 2015 with its determination that the proposed actions are consistent with the Mississippi Coastal Program. As noted in that response, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in Mississippi, as may be applicable. A Section 106 of the National Historic Preservation Act review of this project is currently underway. If any historic properties are determined to be in the project's area of potential effect, all adverse effects will be resolved prior to construction in that vicinity.

Additionally, a Floodplains Statement of Findings was prepared and has been approved by NPS management as required by Executive Order 11988 "Floodplain Management" and NPS Director's Order

#77-2 and its Floodplain and Procedural Manual #77-2 (see Appendix E). Also, a Wetlands Statement of Findings was prepared and has been approved by NPS management as required by Executive Order 11900 "Protection of Wetlands" and NPS Director's Order #77-1 (see Appendix E).

The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. Public comments and Trustee responses are found in Chapter 15.

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Chapter 8: Bon Secour National Wildlife Refuge Trail Enhancement Project

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8.1 Bon Secour National Wildlife Refuge Trail Enhancement: Project Description

8.1.1 Project Summary

This project involves repairing and enhancing an existing trail (Jeff Friend Trail) located on the Bon Secour National Wildlife Refuge (NWR). This aged boardwalk and gravel trail will be repaired and improved to American with Disabilities Act (ADA) standards to ensure safe public access and to enhance the quality of visitor experience. An observation platform will also be constructed along the trail, and two handicapped parking spaces will be widened to better accommodate visitors. The project is not expected to significantly increase visitation, but to provide a safe and enhanced experience for visitors to the refuge.

8.1.2 Background and Project Description

Established in 1980, Bon Secour NWR is located on the Gulf Coast, 8 miles west of the city of Gulf Shores, Alabama, in Baldwin and Mobile counties. Management efforts since 1980 have emphasized acquiring land, securing staff to operate the refuge, and initiating conservation programs that benefit migratory birds and endangered wildlife species. Wildlife habitat consists of beach/dune, maritime forests, and estuarine habitats. A Comprehensive Conservation Plan for Bon Secour NWR was prepared in 2005 to guide management actions and to provide direction for the refuge. Fish and wildlife conservation receives first priority in refuge management; wildlife-dependent recreation is allowed and encouraged as long as it is compatible with, and does not detract from, the mission of the refuge or the purposes for which it was established.

The Jeff Friend Trail was constructed ten years ago to allow handicap access to the Little Lagoon viewshed and to the natural resources of Bon Secour NWR. Over time the trail has surpassed its serviceable life and has become less accessible to the handicapped and elderly. The project will replace the existing and aged gravel trail and wooden boardwalk with a safer, and easier to traverse, new trail made up of compressed rubber material or other suitable material (materials are still being researched) and composite material boardwalk. The project will also widen two handicap parking places in the existing parking lot. The parking spaces are currently too small and require up to 10 feet total added to the width to enable access to two vehicles. And lastly, an approximately 10 foot tall observation platform (made from the same material as the boardwalk) will be placed in a still-to-be-selected area along the trail. The location chosen will depend on the most suitable area that will cause the least impact to habitats and soils. There is an existing platform that is not raised but is the same height as the boardwalk. That existing platform is being considered as a location for the raised platform. There are also sandy, clear areas along the boardwalk that are being considered. The footprint of the platform will be approximately 20 feet by 20 feet.

Since this trail is not new, and is merely a renovation of an existing trail, the use of the area is not anticipated to significantly increase. The purpose of the project is to replace the 10-year old Trail's infrastructure before it is rendered unusable.

Figure 8-1. Bon Secour National Wildlife Refuge area in southern Alabama

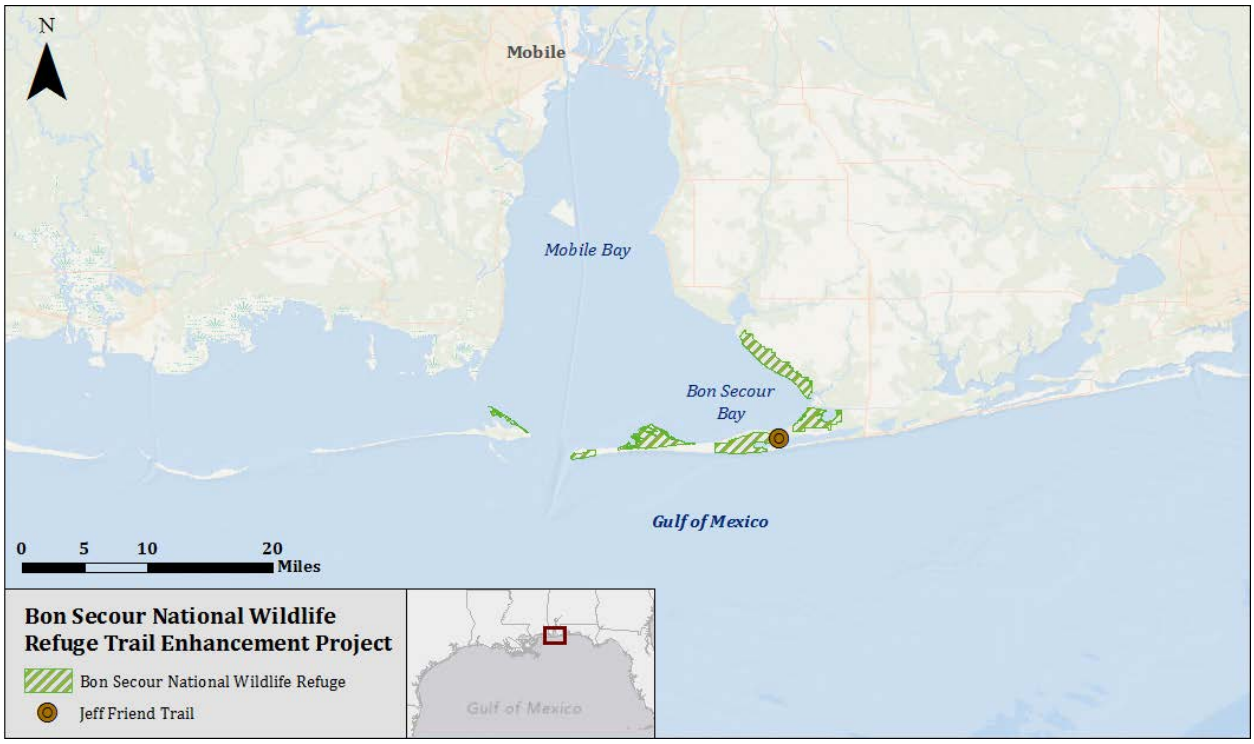


Figure 8-2. Bon Secour National Wildlife Refuge area in southern Alabama

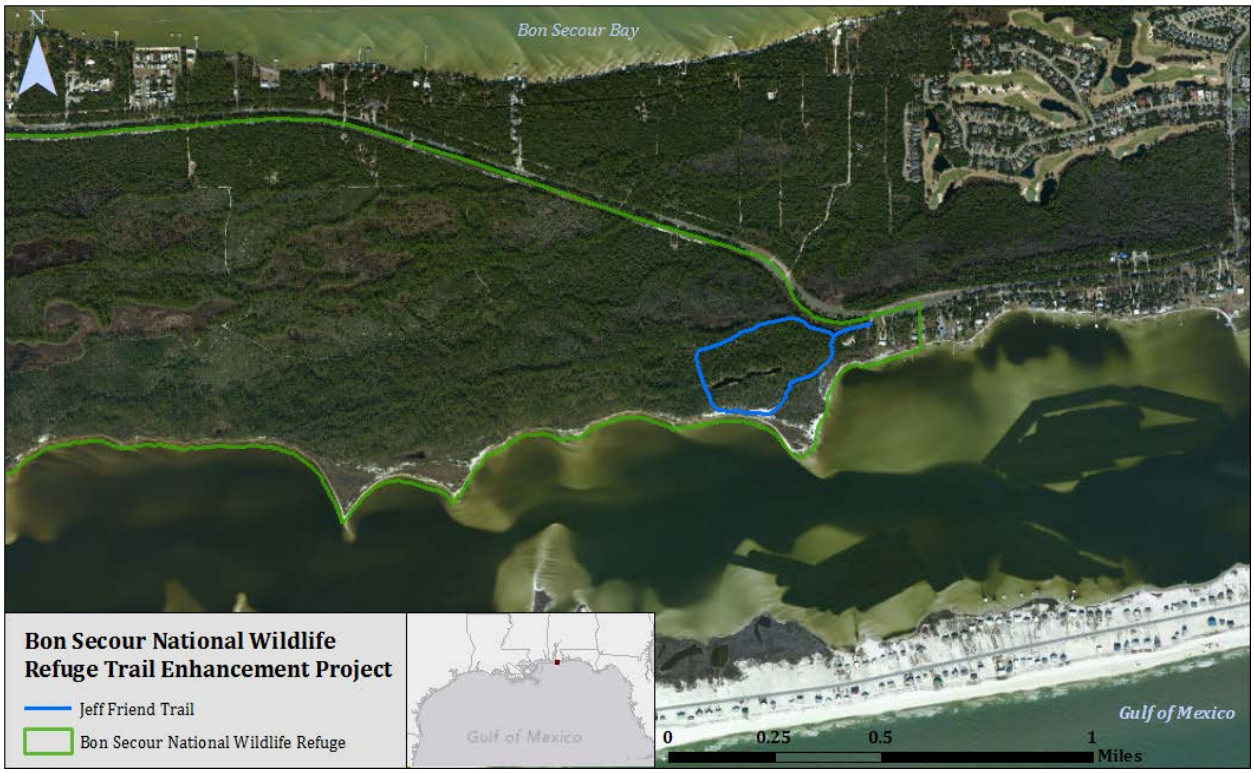


Figure 8-3. Existing handicap parking area (yellow arrow) that is to be widened



Figure 8-4. A portion of the existing Jeff Friend Trail boardwalk



8.1.3 Evaluation Criteria

This project meets the evaluation criteria established for OPA and the Framework Agreement. The project will enhance the public's access to natural resources at the Bon Secour NWR, helping to offset adverse impacts to recreational uses on Department of the Interior (DOI)-managed lands in the five Gulf States caused by the Spill. Thus, the nexus to resources injured by the Spill is clear (see C.F.R. § 990.54(a) (2) and Sections 6a-6c of the Early Restoration Framework Agreement).

The project is technically feasible and utilizes commonly used boardwalk and trail materials and can be implemented with minimal delay. The trails at Bon Secour NWR are commonly used by the public for hiking and wildlife viewing. For these reasons, the project has a high likelihood of success (see C.F.R. § 990.54(a)(3) and Section 6e of the Early Restoration Framework Agreement).

A thorough environmental assessment, including review under applicable environmental statutes and regulations, is described in Section 8.2 and indicates that adverse effects from the project would largely be minor, localized, and of short duration. In addition, the best management practices and measures to avoid or minimize adverse effects described in Section 8.2 would be implemented. As a result, collateral injury will be avoided and minimized during project implementation (15 C.F.R. § 990.54(a)(4)).

Cost estimates are based on similar past projects, and based on these estimates the project can be conducted at a reasonable cost (see C.F.R. § 990.54(a)(1)). As a result, the project is considered feasible and cost effective. The project is not inconsistent with long-term restoration needs (see C.F.R. § 990.54(a)(1),(3), and Sections 6d-6e of the Early Restoration Framework Agreement).

8.1.4 Performance Criteria, Monitoring and Maintenance

The restoration objective of this project is to restore a portion of the lost visitor use on lands managed by DOI in the five Gulf States caused by the Spill by improving the future visitor experience at Bon Secour NWR. This will be accomplished by improving the public's accessibility and enjoyment while using the refuge. The project will be deemed successful when the trail is once again open with safer and longer-lasting infrastructure. As such, performance criteria for this project are the satisfactory construction of the desired trail, boardwalk and parking spaces. No long-term maintenance activities beyond the duration of this project were budgeted. The minor amount of trail maintenance that is anticipated will be part of regular refuge maintenance activities. The monitoring plan for the Bon Secour Trail Enhancement Project can be found in Appendix B.

8.1.5 Offsets

The Trustees and BP negotiated a BCR of 2.0 for this recreational use project. NRD Offsets are $1,090,220 expressed in present value 2014 dollars to be applied against the monetized value of lost recreational use provided by natural resources injured on lands managed by DOI, which will be determined by the Trustees' assessment of lost recreational use for the Spill. Please see Chapter 4 of this document (Section 4.4) for a description of the methodology used to develop monetized Offsets.[1]

8.1.6 Estimated Cost

The estimated cost for this project is $545,110. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, design, implementation, monitoring, and contingencies.

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[1] For the purposes of applying the NRD Offsets to the calculation of injury after the Trustees' assessment of lost recreational use for the Spill, the Trustees and BP agree as follows:

- The Trustees agree to restate the NRD Offsets in the present value year used in the Trustees' assessment of lost recreational use for the Spill.
- The discount rate and method used to restate the present value of the NRD Offsets will be the same as that used to express the present value of the damages.

8.2 Bon Secour NWR Trail Enhancement Project: Environmental Assessment

The proposed recreation enhancement project involves repairing and improving to ADA standards an existing trail (Jeff Friend trail) located on the Bon Secour NWR. This trail (composed of gravel and boardwalk sections) is currently considered potentially hazardous for some visitors and will be repaired and improved to allow safe public access once again, and to improve the quality of visitor experience.

8.2.1 Introduction and Background, Purpose and Need

CEQ encourages federal agencies to "tier" their NEPA analyses from other applicable NEPA documents to create efficiency and reduce redundancy, and has issued guidance on the use of programmatic NEPA documents for tiering (CEQ 2014).

Tiering has the advantage of not repeating information that has already been considered at the programmatic level so as to focus and expedite the preparation of the tiered NEPA review(s). When a PEA or PEIS has been prepared and an action is one anticipated in, consistent with, and sufficiently explored within the programmatic NEPA review, the agency need only summarize the issues discussed in the broader statement and incorporate discussion from the broader statement by reference and concentrate on the issues specific to the subsequent tiered proposal (CEQ 2014). The 2014 Final Programmatic and Final Phase III Early Restoration Plan and Programmatic Environmental Impact Statement (Final Phase III ERP/PEIS) was prepared for use in tiering subsequent early restoration plans and projects, such as Phase IV (see Section 1.3). The Final Phase III ERP/PEIS programmatic analysis describes impacts from implementation of project types, not necessarily specific projects. The Bon Secour Trail Enhancement project falls within the project type "Enhance Public Access to Natural Resources for Recreational Use" as described in that document.

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the Final Phase III ERP/PEIS. This EA qualifies for tiering from the Final Phase III ERP/PEIS in accordance with Department of the Interior regulations (43 CFR 46.140, Using Tiered Documents, b and c). See Section 1.3 for more information on tiering.

This project is consistent with the Final Phase III ERP/PEIS' Preferred Alternative as described in the 2014 Record of Decision (79 *FR* 64831-64832 (October 31, 2014)) and the Trustees find that the conditions and environmental effects described in the broader NEPA document are valid. This EA incorporates by reference the analysis found in the Final Phase III ERP/PEIS relevant to the Bon Secour NWR Trail Enhancement project. This EA also incorporates by reference all Early Restoration introductory, process, background, and Affected Environment information and discussion provided in the Final Phase III ERP/PEIS (Chapters 1 through 6).

8.2.1.1 Background

A Comprehensive Conservation Plan (CCP) for Bon Secour NWR was prepared in 2005 to guide management actions and to provide direction for the refuge. Fish and wildlife conservation receives first priority in refuge management; wildlife-dependent recreation is allowed and encouraged as long as it is

compatible with, and does not detract from, the mission of the refuge or the purposes for which it was established (USFWS 2005[2]). The Jeff Friend trail was proposed at that time to help ensure that disabled visitors could have access to enjoy wildlife-dependent recreation at Bon Secour NWR. This proposed project is consistent with the goals of the 2005 CCP.

The Bon Secour NWR contains 7,000 acres of wildlife habitat for migratory birds, nesting sea turtles and the endangered Alabama beach mouse. The refuge was established by Congress in 1980 to preserve the coastal dune ecosystem, to protect threatened and endangered species, to provide compatible recreational opportunities, and to serve as a living laboratory for students and scientists.

The name Bon Secour comes from the French meaning "safe harbor," very appropriate considering the sanctuary for native flora and fauna that the refuge provides. The refuge serves the additional benefit of comprising one of the largest undeveloped parcels of land on the Alabama coast. Its dunes are a reminder of the Gulf Coast, as it once existed. As a consequence, the refuge has been named as one of the 10 natural wonders of Alabama.

The refuge is small, compared to most national wildlife refuges, and is comprised of five separate units in Baldwin and Mobile counties, Alabama. The full-time staff consists of five people, but the refuge has numerous committed volunteers throughout the year. The refuge hosts more than 100,000 visitors annually.

The Refuge is home to the endangered Alabama beach mouse, which is associated with the sand dunes and sea oats. The beaches serve as nesting sites for loggerhead, green, and Kemp's ridley sea turtles. Habitats include beaches and sand dunes, scrub forest, fresh and saltwater marshes, fresh water swamps, and uplands.

More than 370 species of birds have been identified on the refuge during migratory seasons. The largest are usually ospreys and several species of herons. At the other extreme, seven species of hummingbirds have been identified. Mammals such as red fox, coyotes, and armadillos are also present www.fws.gov/bonsecour

The Jeff Friend Trail is accessed at a gravel parking lot off of Fort Morgan Road just west of the Peninsula Golf Course. The trail is a one mile loop consisting of gravel paths and wooden walkways that pass by lagoon beaches at Childress Point and then loop north past inland marshes and through the maritime forest similar to the north side of Pine Beach Trail. The forest has thick growths of pine trees, live oak, palmetto bushes, hardy wildflowers, and scrub brush. Benches and informational signs are scattered along the trail. The trail was intended to be ADA accessible and provide access to Little Lagoon via boardwalk and gravel path. This trail was constructed more than 10 years ago and has surpassed its serviceable life. The boardwalk is warped and cracked in places. The gravel portion of the trail is not

[2] Unless otherwise noted, information used for the Affected Environment sections in this EA is taken from the 2005 CCP.

easily traversed by wheelchairs (in spite of its purpose) and is frequently the source of visitors' complaints.

The sandy beaches of Bon Secour NWR saw significant oiling during the summer of 2010; the area was subsequently subjected to intense spill response measures. These events resulted in a loss of recreational opportunities and a decrease of quality of visitor experience at this coastal refuge. To help restore this injury, the Trustees propose to repair and enhance the Jeff Friend Trail.

8.2.1.2 Purpose and Need

The proposed action falls within the scope of the programmatic purpose and need for early restoration as described in the Final Phase III ERP/PEIS because it will accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. The proposed action's purpose is to partially restore lost recreation on lands managed by DOI in the five Gulf States as a result of the *Deepwater Horizon* incident. The proposed project is needed to provide a safe and enhanced experience for visitors at Bon Secour NWR. With the rapid development of Alabama's coastline continuing into the foreseeable future, Bon Secour NWR is a rare opportunity for people to experience the natural resources of coastal Alabama in their native condition. The existing infrastructure is well used, but it is also rapidly deteriorating with no funding available for replacement. This recreational experience would soon be lost if not for the proposed project.

8.2.2 Scope of the EA

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the Final Phase III ERP/PEIS. The broader environmental analyses of these types of actions as a whole are discussed in the Final Phase III ERP/PEIS from which this EA is tiered. The information and analyses in this document supplements the programmatic analyses with site-specific information. This EA provides NEPA analysis for potential impacts for site specific issues and concerns anticipated from implementation of the no action alternative and the proposed action, described as follows:

No Action

The No Action alternative, inclusion of which is a NEPA requirement, is a viable alternative, and also provides a benchmark, enabling decision-makers to compare the magnitude of environmental effects of the action alternatives (CEQ 1502.14(d)). In this case, the No Action Alternative is to leave the existing Jeff Friend Trail in its current condition, and to not build the proposed observation platform. The trail would continue to deteriorate and could ultimately be closed in the future if it became unsuitable for any visitor use.

Proposed Action

The Proposed Action is the repair and enhancement of an aged, existing trail (Jeff Friend Trail) at Bon Secour NWR, as described above in Sections 8.1.1 and 8.1.2.

8.2.3 Project Location

The proposed project is located on the eastern boundary of Bon Secour NWR, in Baldwin County on Highway 180. The project proposes improvements to the entire Jeff Friend Trail (Figure 8-1). The trail is located in the Perdue Unit of the Bon Secour NWR. The Jeff Friend Trail (Figure 8-2) begins from the parking area on the east side of the refuge on Ft. Morgan Road, and loops back around to the parking area. The Jeff Friend Trail connects to the Centennial trail, the latter of which would remain open during the construction period and can be accessed via Pine Beach Trail.

8.2.4 Project Scope

The proposed project would be accomplished by a contractor and would replace and enhance the 4,950 foot-long trail.

- Boardwalk section - The 1,250 foot portion of the trail that is currently wooden boardwalk would be removed and replaced with a composite material boardwalk to extend the life of the boardwalk and reduce maintenance time and costs. The new boardwalk would be widened by approximately one foot. Post holes up to 36" deep would be dug by auger, not necessarily in the same places as the existing post holes.

- Gravel sections - The gravel portions of the trail (3,700 feet) would be replaced with either asphalt or a compressed pervious rubber material. If compressed rubber or other material is used to replace the gravel, the existing gravel would be removed (scraped and loaded into dumpsters) and the compressed rubber material would be laid over the existing gravel footprint. The gravel portions of the trail would not be widened. If asphalt is used, the existing gravel would be used as a base material, and after preparation (smoothing, filling), the asphalt would be laid over the gravel.

- Observation platform - An observation platform would be constructed along the boardwalk. The platform would be approximately 10 feet tall, with a footprint of approximately 20 feet by 20 feet and is planned to have ramps that could accommodate wheelchairs. The exact location of the viewing platform has not been determined at this time, but would be located somewhere along the boardwalk portion of the trail where visitors could view Little Lagoon. There is an existing platform along the boardwalk that overlooks Little Lagoon, but it is not raised and is the same height as the boardwalk. The raised observation platform may be located over that existing platform, or it may be sited on a level sandy area on the opposite side of the boardwalk, similar to the area in Figure 8-4.

- Parking spaces - The two ADA-compliant parking spaces in the gravel parking lot would be widened to improve vehicular access. The two existing handicap parking spaces would be widened by a total of approximately 10 feet (Figure 8-3). The existing material would be excavated, the area would be prepared and gravel or asphalt would be installed.

Staging of equipment and materials for the project would take place in the existing parking area which is large enough to accommodate staging and parking without impacting visitor parking. The trail may be repaired and reconstructed in phases so the equipment needed for each phase is not staged and idle for any period longer than necessary. Much of the work would be done by hand or with hand held tools. However, it is anticipated that small construction equipment such as a Bobcat, backhoe, pickup truck, smooth drum vibratory roller, asphalt machine and if needed, a 12 cubic yard dump truck would be used. Construction may require about 300 loose cubic yards of trail material using 26 ton capacity dump trucks. If needed, the dump truck would be expected to make approximately 50 trips, about 10 per day over a period of about 5 days. Post holes along the boardwalk section would be dug by skid steer with auger attachment and hand tools where an auger will not gain access. Some of this equipment would be required to scrape and recover gravel from the existing trail if not used as a base for its replacement. The existing trail is wide enough to accommodate any of these vehicles that would need access on the trail. The trail is a loop so vehicles should not have to backtrack or turn around. However, there are two small areas along the trail (about 20 feet by 30 feet) that are clear and could be used for turnarounds if that would be necessary.

A 6-inch drain pipe would be installed at intervals along the trail in areas most conducive to draining water away from the trail during rainfall. The demolished wooden boardwalk would be loaded into dumpsters provided by the contractor. The contractor would dispose of construction debris at a permitted facility of his/her choice.

The proposed project could require up to three months for construction. No particular season is ideal to minimize inconveniences to people or natural resources: most visitor use is in the winter, birds migrate through in spring and fall, and birds nest during the summer. The goal is to narrow the construction window as much as possible.

8.2.5 Operations and Maintenance

Maintenance activities would be conducted by Bon Secour NWR. This project would require no changes to be made to the existing, normal operation of the Refuge. Refuge beaches and trails are open 7 days a week during daylight hours only. There are no pets allowed on the refuge. For a complete list of rules and regulations at Bon Secour NWR, see http://www.fws.gov/bonsecour/regulations.html.

8.2.6 Affected Environment and Environmental Consequences

Under the NEPA, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

In order to determine whether an action has the potential to result in significant impacts, the context and intensity of the action must be considered. Context refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). Intensity refers to the severity of impact and could include the timing of the action (e.g., more intense impacts would occur during critical

periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse.

For purposes of this document, impacts are characterized as minor, moderate or major, and temporary or long-term. The analysis of beneficial impacts focuses on the duration (short- or long-term), without attempting to specify the intensity of the benefit. The definition of these characterizations is consistent with that used in the Final Phase III ERP/PEIS, and can be found in Appendix D.

According to the CEQ Regulations for Implementing NEPA (Section 1502.1 and 1502.2) agencies should "focus on significant environmental issues" and for other than significant issues there should be "only enough discussion to show why more study is not warranted." After preliminary investigation, some resource areas were determined to be either unaffected or minimally affected by the proposed action. These resources are not discussed in further detail below. Only those resource areas with potential, adverse impacts are discussed in detail below.

The programmatic analysis looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resources that are not expected to be affected are simply not evaluated further under a given project. Resource areas not analyzed in detail here along with a brief rationale for non-inclusion are:

- Socioeconomics - Project spending could benefit the local economy, but would be temporary, and the contribution to the local economy, overall, would be very minimal.

- Environmental Justice - The intent of an environmental justice evaluation under Executive Order 12898,"Federal Actions to Address Environmental Justice in Minority and Low Income Populations" (1994), is to identify communities and groups that meet environmental justice criteria, and suggest strategies to reduce potential adverse impacts of projects on affected groups. The purpose of Executive Order 12898 is to identify and address the disproportionate placement of adverse environmental, economic, social, or health impacts from Federal actions and policies on minority and/or low-income communities. This order requires lead agencies to evaluate impacts on minority or low-income populations during preparation of environmental and socioeconomic analyses of projects or programs that are proposed, funded, or licensed by Federal agencies. This project would have no effects as defined by the Executive Order.

- Hydrology and water quality - The project occurs completely on land and is merely a repair and enhancement of an existing trail. No wetlands would be impacted and no change to hydrology or water quality is anticipated.

8.2.6.1 Physical Environment

The climate of the refuge is characterized by warm, humid summers and relatively mild winters. Average maximum summer temperatures vary from the high 80s to low 90s Fahrenheit. During winter months, freezing is not uncommon, and temperatures less than 19 degrees Fahrenheit can occur.

Annual precipitation ranges from 52 to 64 inches along the coast. The central Gulf Coast also has one of the highest frequencies of hurricane landfalls in the nation. The bay is additionally influenced by tidal changes that average a little less than 12 feet throughout the year. All of these factors, combined with highly variable river flows, contribute to a hydrology that is dynamic, complex, and necessary to support the variety of plants and animals existing in the Mobile Bay Estuary.

8.2.6.1.1 Geology and Substrates

Affected Environment

Bon Secour NWR lands are a fragile combination of barrier islands, low-lying marshes, and highly erodible mainland shores. Frequent and large storms rejuvenate the barrier ecosystem. The refuge is part of an unstable land mass, constantly shifting and moving due to the frequent hurricanes that pummel the coastal area of the Fort Morgan Peninsula. The project location is made up of flat, well-drained sandy soils with areas covered with lichen and leaf litter.

Environmental Consequences

No Action

Under the No Action alternative, there would be no impacts to substrates or geology. No construction activities would take place that would displace substrates or impact geological features or processes.

Proposed Action

Sections 6.5.1 and 6.7.1.1 of the Final Phase III ERP/PEIS describe the impacts to geology and substrates from early restoration projects intended to enhance public access to natural resources for recreational use. Section 6.5.1.1 states that these types of projects could require work with heavy equipment in construction or staging areas that would temporarily disturb soils and sediments in upland, shallow water areas or nearshore habitats. These construction activities could result in the local removal, compaction, and erosion of upland, shallow-water, and nearshore substrates in construction/development areas. These would be minor to moderate short- to long-term adverse effects because they would be localized and could have readily apparent effects on local soils, substrates and/or geologic features, with some effects lasting only during the construction period (heavy equipment use) and others extending beyond the construction period (compaction and displacement resulting from infrastructure).

For this project type, impacts to geology and substrates were analyzed adequately within the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III

ERP/PEIS analysis. The proposed project would have a temporary, minor impact on substrates and no impact on geology. Substrates within the footprint of the project (approximately one mile long and 4 feet wide), and a 20 feet by 20 feet area for the observation platform would be affected through excavation of the existing sandy soils in the platform area, addition of asphalt over the existing gravel trail or removal of the gravel and replacing with a compressed rubber material, and placement of post holes in the boardwalk areas. These activities are not expected to cause more than minor erosion in the area due to the flat location with sandy, well drained soils. Adverse impacts would be minor, local and temporary.

Mitigation measures for impacts to geology and substrates are found on page 13 of Appendix 6A of the Final Phase III ERP/PEIS. Measures that would apply to and be implemented for the proposed Bon Secour Trail Enhancement project include:

- Employment of standard BMPs for construction to reduce erosion.
- Soil disturbance would be to the minimum area and the minimum length of time necessary to complete the action.
- Seasonal rainfall would be factored into the construction timeline to reduce ground disturbance during raining or flood seasons.
- Selection and operation of heavy equipment to minimize adverse effects to the environment (e.g., minimally-sized, low-pressure tires, minimal hard turn paths for tracked vehicles, temporary mats or plates within wet areas or sensitive soils).

8.2.6.1.2 Air Quality and Greenhouse Gas Emissions

Affected Environment

The project area is located within Baldwin County, Alabama, which is currently in attainment with the NAAQS for all criteria pollutants (EPA 2015).

Environmental Consequences

No Action

Under the No Action alternative, there would be no increased use of fossil fuel burning equipment in the area, and no dust causing activities from soil disturbance. No impacts to air quality or GHG levels would occur. No mitigation measures would be necessary.

Proposed Action

Sections 6.5.1.3 and 6.7.3.2 of the Final Phase III ERP/PEIS describe the impacts to air quality and greenhouse gas emissions from early restoration projects intended to enhance public access to natural resources for recreational use. Section 6.5.1.3 of the PEIS states, “During construction activities, short-term impacts to air quality and GHGs would occur from the use of gasoline and diesel powered

construction vehicles and equipment, including barges, and exhaust produced by the use of this equipment. Examples of project-specific projected emissions are located in Chapters 8 through 12. The severity of impacts would be highly dependent on the length and type of construction required and the location of the project. There is a slight potential for fugitive dust creation from construction activities, resulting in minor to moderate adverse impacts. Long-term minor adverse effects from these enhancements due to increased recreational use and associated vehicle traffic may occur."

For this project type, air quality impacts were analyzed adequately within the Phase IIIERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Materials and equipment would be moved via truck to the project site on commercial roads. Project implementation would require the use of equipment which would temporarily affect air quality in the project vicinity due to construction vehicle emissions (See Table 8-1). Excavation associated with construction of portions of the improvements may produce fine particulate matter. However, this impact would be short-term, only occurring during active construction activities. Consistent with the programmatic analysis, any air quality impacts that would occur would be localized and short in duration. Therefore, any adverse impacts to air quality would be short-term and minor.

CEQ guidance states that Federal agencies, to remain consistent with NEPA, should consider the extent to which a proposed action and its reasonable alternatives contribute to climate change through GHG emissions and take into account the ways in which a changing climate over the life of the proposed project may alter the overall environmental implications of such actions. CEQ recommends that agencies use a reference point to determine when GHG emissions warrant a quantitative analysis taking into account available GHG quantification tools and data that are appropriate for proposed agency actions. In addressing GHG emissions, agencies should be guided by the principle that the extent of the analysis should be commensurate with the quantity of projected GHG emissions. When assessing the potential significance of the climate change impacts of their proposed actions, agencies should consider both context and intensity, as they do for all other impacts (CEQ Draft GHG guidance, 2014).

In its recent guidance, CEQ provides a reference point of 25,000 metric tons of CO_2 emissions on an annual basis below which a GHG emissions quantitative analysis is not warranted unless quantification below that reference point is easily accomplished. CEQ states that this is an appropriate reference point that would allow agencies to focus their attention on proposed projects with potentially large GHG emissions. In its guidance, the CEQ "Recommends that an agency select the appropriate level of action for NEPA review at which to assess the effects of GHG emissions and climate change, either at a broad programmatic or landscape-scale level or at a project- or site-specific level and that the agency set forth a reasoned explanation for its approach". The Trustees have reasoned that due to the small-scale and short duration of the construction portion of the project, predicted GHG emissions would be short-term and minor and would not exceed 25,000 metric tons per year, and thereby does not warrant a quantitative analysis of GHG emissions.

The use of gasoline and diesel-powered construction vehicles and equipment, including trucks, dozers etc., would contribute to an increase in GHG emissions. Although it is difficult to develop an accurate estimation of total fuel consumption associated with construction vehicle and equipment operation, the

assumptions presented in Final Phase III ERP/PEIS project chapters 8 through 12 for air emissions from construction activities serve as useful guidelines for estimating the levels of GHG emissions for the Bon Secour Trail Enhancement project. The same types of equipment and length of use for similar analyses in the Final Phase III ERP/PEIS did not come close to the reference point of 25,000 metric tons of CO_2 emissions requiring a quantitative analysis.

Table 8-1. Equipment that would most likely be used to implement the proposed Bon Secour NWR Trail Enhancement Project

Smooth drum vibratory roller
Dump truck, 25 ton
Bituminous paver, 8 ft. wide
Backhoe or Front-end loader
Bobcat with auger

Available impact minimization measures would be employed to reduce the release of GHG during project implementation. The following minimization measures have been identified in the Final Phase III ERP/PEIS to reduce or eliminate GHG emissions from the construction phase of the proposed project:

- Shut down idling construction equipment, if feasible;
- Locate staging areas as close to construction site as practicable to minimize driving distances between staging areas and construction site;
- Encourage the use of the proper size of equipment for the job to maximize energy efficiency; and

8.2.6.1.2 Noise

Affected Environment

Section 3.2.4 of the Final Phase III ERP/PEIS states the primary sources of terrestrial noise in the coastal environment are transportation and construction-related activities. The primary sources of ambient (background) noise in the project area are humans and natural sounds such as wind and wildlife. The levels of noise in the project area varies, depending on the season, and/or the time of day, the number and types of sources of noise, and distance from the sources of noise. Noise-sensitive land users in the project area include visitors to the Refuge.

Environmental Consequences

No Action

Under the No Action alternative, there would be no increase in noise levels in the area. No construction equipment would be used on site. Workers would not be present adding to the ambient noise levels. No mitigation measures would be necessary.

Proposed Action

Section 6.5.1.4 of the Final Phase III ERP/PEIS states that during the construction period, adverse impacts to ambient noise levels could occur, particularly along shorelines where construction activities would take place. The severity of impacts would depend to a large degree on the location of the project and the amount of noise that these activities would generate and the distance to sensitive receptors such as recreational users or wildlife. Installation activities, equipment operation, and vehicle traffic associated with the construction activities could result in short-term minor to major adverse impacts to noise, especially if they occurred in natural areas. For example, during the use of motorized heavy equipment such as cranes and barges, noise would be created which would be readily apparent and attract attention. Although such changes would not dominate the soundscape and some sounds could be dampened or masked by ambient wave or ship noise, these actions could detract from the current user activities or experiences and create audible contrast for visitors in the project area.

For this project type, noise impacts were analyzed adequately within the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Implementation of the proposed project would include transportation of construction materials to the project area, which may include trucks or other types of transportation. The equipment used for transportation and construction would produce noise. Construction equipment is known to disturb nesting birds. The timing of noise producing activities would be planned to minimize disturbance to nesting birds.

Construction noise can also be a nuisance to visitors visiting the Refuge. Recreational users in the vicinity of the proposed project would have the opportunity to use other nearby trails (e.g. Centennial Trail) during construction activities. Consistent with the programmatic analysis, because construction noise is temporary and unlikely to result in users changing their activities, any negative impacts to the human environment during construction activities would be short-term and minor. Once facilities are constructed, noise patterns would return to pre-project levels.

8.2.6.1.3 Summary of Impacts to the Physical Environment

Under the No Action Alternative, there would be no impacts to geology and substrates, air quality and GHGs, or noise levels in the area. Under the Proposed Action, short-term minor adverse impacts to substrates, air quality and GHGs and noise levels would occur from construction activities and use of vehicles and equipment. Due to the small scale and scope of the project and the use of BMPs discussed in the sections above, no significant adverse impacts to the physical environment would occur.

8.2.6.2 Biological Environment

The Jeff Friend Trail is a loop that passes through maritime forest dominated by common native scrub species such as Ilex, pine and oak. The area is primarily rural, but single family beach homes are nearby the project, most notably just east of the parking area. The soil is primarily sandy, and it is covered with lichen and leaf litter. The occasional interdunal moist swale is found in the area, though not under the Trail. There is one large ephemeral wetland near the Trail. The Trail also runs near the northern shores

of Little Lagoon, which is a brackish dune lake; Little Lagoon has a marine connection maintained by a cut in the lagoon's southern shoreline. A list of species recorded at Bon Secour NWR can be found at http://www.fws.gov/bonsecour/species.html.

8.2.6.2.1 Living Coastal and Marine Resources

Affected Environment

Habitats

Coastal habitats of Bon Secour Refuge include uplands such as beach/dune, grassland, strand, and maritime hammocks, as well as wetlands such as tidal marshes. Each habitat is shaped by strong and consistent winds, saltwater spray, and sun. Typical beach/dune vegetation includes sea oats, cordgrass, sand spur, dune panic grass, and morning glory. Coastal grasslands include muhly grass, bluestem grasses, and sea oats, as well as occasional shrubs such as wax myrtle and groundsel. Coastal strands and maritime hammocks include shrub and tree species that are tolerant of wind and salt spray, such as saw palmetto, sand live oak, cabbage palm, yaupon, sea grape, and prickly pear. Tidal marsh habitats include grasses, rushes, and sedges along low wave-energy wetlands and river mouths. Typical species include black needle rush, smooth cordgrass, and saw grass. The project area is primarily a mature maritime forest dominated by common native scrub species such as Ilex, pine and oak (Figure 8-5). There are some swales containing sedges, and one large ephemeral wetland. The occasional moist swale containing sedges is found in the area, though not in the proposed project footprint. There is one large ephemeral wetland near the Trail. The Trail also runs near the northern shores of Little Lagoon (Figure 8-6), which is a brackish dune lake; Little Lagoon has a marine connection maintained by a cut in the lagoon's southern shoreline. Invasive species that occur on Bon Secour near the project area are cordon grass and Chinese tallow.

Figure 8-5. Mature maritime forest along Jeff Friend Trail



Photo by Robin Renn, USFWS

Figure 8-6. Closest section of the Jeff Friend Trail to Little Lagoon



Photo by Robin Renn, USFWS

Migratory Birds

Bon Secour Refuge represents some of the best remaining stopover and staging habitat for Neotropical migratory songbirds during the fall and spring migration along the Alabama coastline. Migratory birds utilize this area for resting and building fat reserves critical to successful migration (Moore and Woodrey 1993, and Moore and Woodrey 1997 as cited in USFWS 2005). The refuge also provides crucial habitat for beach nesting birds, such as snowy and Wilson's plovers, American oystercatchers, least terns and black skimmers; secretive marsh birds, such as rails; and migratory and wintering shorebirds on beaches, especially the federally threatened piping plover and red knot. Shorebirds use beaches and washover sites, which support high quality food sources during migration and winter.

Environmental Consequences

No Action

Under the No Action alternative, there would be no construction; therefore, no increase in construction-related impacts from noise and human presence that would cause birds to leave the area would occur. No mitigation measures would be necessary.

Proposed Action

Habitats

The Final Phase III ERP/PEIS states that some recreational enhancement projects may have long-term beneficial effects on wetlands, barrier islands, beaches, coastal transition zones, SAV and shallow water habitats. For example, enhancement projects could reduce degradation and recreation use in habitats in settings where recreation usage that is currently diffuse is redirected to a site that is more appropriate and conducive to recreational activities. Impacts discussed in the Final Phase III ERP/PEIS that are relevant to the Bon Secour NWR Trail Enhancement Project include: soil erosion, vegetation trampling, vegetation removal, or other human activity from project staging or construction, or implementation of recreational enhancements and localized plant species displacement or loss, introduction of invasive species, and degradation of habitats including potential habitat fragmentation as a result of an increased recreational activity and human encroachment in habitats, such as beaches or wetlands. It also states that these effects would depend on the size and scale as well as the location of facilities. Effects would also vary depending on presence of sensitive habitats and availability of other similar sensitive habitats in the project vicinity.

For this project type, impacts to habitats were analyzed adequately within the PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. Habitats near the Jeff Friend Trail would not be adversely impacted by the proposed action. No removal of shrubs, grass or trees is planned. Except for widening the boardwalk portion by one foot, the footprint of the trail would not change. The raised observation platform would be sited in an area (flat, sandy) that would minimize impacts to habitats, or would be sited over an existing non-raised platform. The potential for introduction or spread of invasive species would be minimized by requiring the contractor to clean all equipment before entering and when leaving the refuge. Consistent with the programmatic analysis, minor, long-term beneficial impacts to habitats could occur from improving the Trail and repairing the boardwalk. Visitors would stay on the Trail and not walk through habitat next to the trail to avoid areas of the trail in disrepair. Guided nature walks that educate the public on the importance of the habitats and other natural resources found on the Bon Secour NWR are conducted on the Jeff Friend Trail.

Migratory Birds

One of the most important management priorities at Bon Secour NWR is protection of migratory birds. The area used by migrating birds resting and foraging in proximity to the trail that could potentially be impacted is very small in comparison to the available habitat within the entire refuge. Migrating birds would utilize other areas of the refuge (up to 7,000 acres of wildlife habitat) while construction activities were taking place. Impacts to resident, nesting birds would be minimized using applicable mitigation measures listed in the Final Phase III ERP/PEIS Chapter 6, Appendix 6-A, page 3. Measures that would be implemented for this project include:

- Using care to avoid birds when operating machinery or vehicles near birds.
- Surveys for nests prior to construction activities thereby avoiding nests during construction.

8.2.6.2.2 Protected Species

Information for the presence of protected species and analyses in this section is from the Biological Evaluation Form completed for ESA Section 7 reviews and consultations required for early restoration projects and activities. Only those species considered to have the potential to occur in the project area are analyzed below.

Affected Environment

Alabama beach mouse

This federally listed species inhabits the beach dune and scrub/shrub habitats found along the Fort Morgan Peninsula. Beach mice have experienced a two-thirds reduction in available habitat, primarily due to coastal development. Bon Secour NWR protects the last remaining undisturbed beach mouse habitat found in Alabama, consisting of several key plant communities that form a mosaic of micro-habitats. Critical habitat for beach mice is currently listed as 500 feet landward to the mean high tide line, which includes the beach dunes; however, the mice also occur in scrub/shrub habitats north of these dunes. The Perdue Unit of the refuge represents the largest and best remaining example of beach mouse habitat protecting approximately four miles of beach with well-developed dune and scrub/shrub/swale habitat. Neither beach mice nor their critical habitat are found within the Jeff Friend Trail project area.

Sea turtles

Loggerhead (threatened), green (threatened), and Kemp's ridley (endangered) sea turtles have been documented to nest on the refuge. Green and loggerhead sea turtles have long been a focus of management concern as Kemp's are rare visitors. Conservation strategies to protect these turtles under the ESA include on-site nest monitoring and protection, as well as fostering a public ethic through educational programs. Refuge personnel patrol the beach for sea turtle nests on areas between refuge management units, some of which include private lands.

There are no records of sea turtles ever nesting on the beaches of Little Lagoon. Critical habitat for nesting loggerhead sea turtles is present on Bon Secour NWR Gulf-facing beaches but it is not present within the action area.

Gopher tortoise

Gopher tortoise is a candidate species on the refuge. No gopher tortoises or their burrows have been observed within two miles of the trail site.

Eastern indigo snake

The project area theoretically contains suitable habitat for the threatened eastern indigo snake, which is a commensal species with gopher tortoise. However, the eastern indigo snake has not been observed in the state of Alabama since 1954 and is considered functionally extirpated from Alabama (USFWS 2008).

Bon Secour refuge staff annually traps for snakes in the project area and have never collected an eastern indigo snake. Moreover, no gopher tortoise burrows have ever been observed within two miles of the trail site. Eastern indigo snake does not have designated critical habitat.

Piping plover and Red knot

A portion of the refuge's Fort Morgan unit and all of Little Dauphin Island are designated as critical habitat for the piping plover. There is no critical habitat designated in the Perdue unit, where the Jeff Friend Trail is located. Wintering red knot (threatened) and piping plover (threatened) are not expected to occur on the northern shores of Little Lagoon, and neither species is present during the summer.

Environmental Consequences

Potential impacts to the following protected species were analyzed: Alabama beach mouse, sea turtles, gopher tortoise, eastern indigo snake, piping plover and red knot.

Alabama beach mouse

Neither the beach mouse nor its critical habitat exists within the project area. The project area contains only maritime forest, swales, and ephemeral wetlands; no Aeolian sand formations or food sources common to beach mouse habitat. Accordingly, the Trustees have determined that the proposed project would have no effect on Alabama beach mouse. In March 2015, the Trustees requested concurrence from the USFWS regarding this determination (DOI 2015). The U.S. Fish and Wildlife Service provided concurrence with this determination on April 10, 2015 (USFWS 2015).

Sea turtles

The proposed action would have no effect on sea turtles as no species of sea turtle nests on the shores of Little Lagoon. Accordingly, the Trustees have determined that the proposed project would have no effect on sea turtles. In March 2015, the Trustees requested concurrence from the USFWS regarding this determination (DOI 2015). The U.S. Fish and Wildlife Service provided concurrence with this determination on April 10, 2015 (USFWS 2015).

Gopher tortoise

The proposed action would have no effect on gopher tortoise as their burrows have not been observed within two miles of the trail site. In the event a burrow with a tortoise would be discovered during construction, the tortoise would be relocated to a suitable site on the refuge. Accordingly, the Trustees have determined that the proposed project would have no effect on Gopher tortoise. In March 2015, the Trustees requested concurrence from the USFWS regarding this determination (DOI 2015). The U.S. Fish and Wildlife Service provided concurrence with this determination on April 10, 2015 (USFWS 2015).

Eastern indigo snake

The proposed action would have no effect on the eastern indigo snake. Eastern indigo snake has not been seen in the state of Alabama since 1954, and the Bon Secour refuge staff traps annually for snakes. Accordingly, the Trustees have determined that the proposed project would have no effect on Eastern indigo snake. In March 2015, the Trustees requested concurrence from the USFWS regarding this determination (DOI 2015). The U.S. Fish and Wildlife Service provided concurrence with this determination on April 10, 2015 (USFWS 2015).

Piping plover and Red knot

Construction timing may be proposed between May and August when piping plover and red knots are on their breeding grounds (i.e., northern US and Canada). These wintering birds would not be present during the May to August construction window. However, if necessary (e.g., weather conditions, balancing multiple resource needs) construction could occur outside that timeframe when either species may be present. If the project is constructed during the winter, the northern shoreline of Little Lagoon, which is near the project, could be used by either species though it is not the type of habitat preferred by these wintering birds. The conservation measures (BMPs) below are designed to minimize exposure of piping plover and red knot to noise and human disturbance, should they be present.

- Provide all individuals working on the project with information in support of general awareness of piping plover or red knot presence and means to avoid birds and their habitats.
- If piping plover or red knots are present within 150 feet of the project area, construction and the operation of any equipment will be halted until the birds leave the area of their own volition.

When these measures are properly implemented, these species generally move away from the action and fly to nearby suitable habitat and resume normal activities. Additional suitable habitat is within a half mile of the action area which is within the normal range of daily foraging movements.

Because of nearby suitable habitat and the ability to properly implement these conservation measures, the Trustees have determined the proposed project may affect, but will not likely adversely affect the piping plover or red knot. Accordingly, the Trustees have made a “Not Likely to Adversely Affect” determination under the ESA for piping plover and red knot. In March 2015, the Trustees requested concurrence from the USFWS regarding these determinations (DOI 2015). The U.S. Fish and Wildlife Service provided concurrence with this determination on April 10, 2015 (USFWS 2015).

8.2.6.2.3 Summary of Impacts to the Biological Environment

Under the No Action alternative, there would be no adverse impacts to living coastal and marine resources, including habitats, migratory birds, and other protected species. Although not anticipated, if piping plover and red knot would use the beaches of Little Lagoon near the trail for foraging, no construction activities would be present to cause them to move away. No mitigation measures would be necessary.

Under the proposed action, habitats near the Jeff Friend Trail would not be adversely impacted. No removal of shrubs, grass or trees is planned. Except for widening the boardwalk portion by one foot, the footprint of the existing trail would not change. The raised observation platform would be sited in an area (flat, sandy) that would minimize impacts to habitats, or would be sited over a non-raised platform that is already a part of the existing trail. Any impacts to habitats would be minimized using mitigation measures. Mitigation measures would avoid or minimize potential impacts to migratory birds. For threatened, endangered, and candidate species with potential to occur in the project area, no effect is anticipated to Alabama beach mouse (endangered), sea turtles (loggerhead and green are threatened, Kemp's ridley is endangered), gopher tortoise (candidate), and eastern indigo snake (threatened). The proposed project is not likely to adversely affect piping plover (threatened) and red knot (threatened). There is no designated or proposed critical habitat within the project area, therefore none would be adversely modified or destroyed. The USFWS provided concurrence on the Trustees' determinations for effects from the proposed project to endangered, threatened and candidate species.

8.2.6.3 Human Uses

8.2.6.3.1 Cultural Resources

Affected Environment

The National Historic Preservation Act of 1966 (NHPA) charges the federal government with considering the potential effects of its actions on the nation's cultural and historic resources. Archaeological sites have been reported to exist near the project area. This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties.

Environmental Consequences

No Action

Under the No Action alternative, no construction would take place. No scraping, auguring or digging would take place. Cultural resources would not be impacted as ground disturbing activities would not occur. No mitigation measures would be necessary.

Proposed Action

The Final Phase III PEIS concludes that if not properly conducted, activities conducted under this project type have the potential to compromise a site's integrity and cause a loss of cultural information. BMPs and other mitigation measures that may be employed, depending on site-specific considerations, to further minimize or contain adverse impacts to cultural resources are detailed in Appendix 6-A.

Chapter 6, Section 6.6.2, Tables 6-3, 6-4 and Tables 6A-1, 6A-2, found in Chapter 6, Appendix A of the Final Phase III ERP/PEIS describe potential impacts and mitigation measures for cultural resources. Those that apply to the Bon Secour Trail Enhancement project include conducting preconstruction surveys for the presence of sensitive natural and cultural resources.

A complete review of the proposed project under Section 106 of the NHPA would be completed prior to implementation. Tribal Consultations would be initiated with all interested federally recognized tribes. This proposed project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

8.2.6.3.2 Aesthetics and Visual Resources

Affected Environment

Chapter 3, Section 3.4.9 of the Final Phase III ERP/PEIS discusses aesthetics and visual resources. "Aesthetics and visual resources define the visual character of an area. These resources can be natural features, vistas, or viewsheds and can include urban or community features such as architecture, skylines, or other man made characteristics. The current Gulf of Mexico coastal region is characterized by thousands of miles of shoreline, which is bordered by a variety of landscapes, including natural and maintained beaches, mangroves and other wetlands…These routes pass through coastal and upland portions of Louisiana, Alabama, Mississippi and Florida. There are many other ways to experience the visual and aesthetic resources of the Gulf Coast as well (e.g. boating and hiking)".

The shores of Little Lagoon and the maritime forest habitat that the Jeff Friend Trail passes through offer a beautiful viewshed for the visitor wanting to experience what the gulf vistas were like before increased development along the Alabama coast. Walking the refuge trails provides visitors the opportunity to experience different habitats of the refuge such as dunes, swales, wetlands, maritime forests and scrub habitats http://www.fws.gov/bonsecour/trails.html. The photo below (Figure 8-7) was taken from the Jeff Friend Trail looking out over the shores of Little Lagoon.

Figure 8-7. View of Little Lagoon from the Jeff Friend Trail



Photo by Ben Frater, USFWS

Environmental Consequences

No Action

Under the No Action alternative, there would be no impacts to aesthetics and visual resources in the area from the observation platform. The observation platform would not be constructed. A minor, long-term adverse impact to aesthetics would occur from the no action alternative if the Jeff Friend Trail is not repaired. The boardwalk is unsightly in some areas and the gravel portion where the trail has settled shows some of the erosion control material that at one time was covered with gravel. The gravel portion of the trail may be replaced with aesthetically pleasing, natural looking compressed rubber material that would enhance the natural look of the immediate area, or may be replaced with asphalt which would have a net effect of minimal impact.

Proposed Action

The Final Phase III ERP/PEIS states that this project type "would have minor to moderate short-term adverse impacts from the temporary landscape during the construction period from the presence of bulldozers, front-loaders and other large earth moving equipment required for upgrades or new facilities. These impacts would constitute a change in the viewshed that is readily apparent and which would attract attention in the short-term. Although such changes would not dominate the viewscape, they could detract from the current user activities or experiences. Over the long-term, the addition of infrastructure and facilities into the existing setting would present some degree of visual contrast. Long-term adverse effects of these enhancements would range from minor to moderate, depending on the existing aesthetic character of the surrounding landscape. Where the addition of these facility enhancements into the existing setting would present a large degree of visual contrast, impacts would be moderate because they would detract from the current user activities or experiences."

For this project type, impacts to aesthetics and visual resources were analyzed adequately within the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. The construction of the proposed viewing platform could create a potential minor, adverse impact to visual resources from the trail. If the platform were to be constructed between the trail and Little Lagoon it could block a small area of visitors' view of certain vistas. One potential site for the viewing platform would be where a platform is currently located adjacent to the boardwalk area (see Figure 8-6). This existing platform is not raised and is the same height as the boardwalk. This would be replaced with the proposed 10 foot tall platform. This adverse impact could be offset by a beneficial impact for those who use the platform to view the beaches and Little Lagoon. Other potential sites for the proposed viewing platform are located in the sandy area on the side of the trail not facing Little Lagoon (see Figure 8-4). Locating the platform in that area would have minimal impact on visual and aesthetic resources, but the platform would be farther from the shoreline, impacting the viewer's vista of Little Lagoon. The boardwalk and observation platform would be constructed from composite materials made to look like wood. The gravel portion of the trail may be replaced with compressed rubber material made to mimic natural materials, lending a more natural look to the trail and would create a beneficial impact to aesthetics and visual resources. Replacing the gravel portion with asphalt would not create a visual/aesthetic impact over that of the existing gravel.

8.2.6.3.3 Infrastructure

Affected Environment

Most of the infrastructure at Bon Secour NWR is located in the Perdue Unit. Four trails, a refuge office, kiosks and other educational signage are located there. Parking areas are located at the Jeff Friend Trailhead and the Pine Beach Trailhead. State highway 180 runs through the refuge. Mobile Street runs through the Perdue Unit.

Environmental Consequences

No Action

Under the No Action alternative, moderate, adverse long-term impacts to infrastructure at Bon Secour NWR would occur. The Jeff Friend Trail would not be repaired and enhanced. The trail would continue to deteriorate and possibly become unusable in the future. Closure of the trail could occur.

Proposed Action

The Final Phase III ERP/PEIS, Section 6.6.3, states that this project type would likely involve the transport of materials and use of construction vehicles and equipment. These project types, which include techniques such as construction of boardwalks and trails, could lead to short and long-term minor to major impacts on infrastructure. The impacts associated with these projects would result from increases in construction traffic; temporary or permanent closure of roads, parking lots, or facilities; or damage to roadways or other infrastructure that provides access to the shoreline. The impacts to existing infrastructure, such as roadways, could also occur from increased vehicle use as a result of increased visitor use over time. These impacts would range in intensity based on the duration of road, parking lot or public access closure, the importance of individual roadways as regional transportation arterials; and the extent and duration of damage to roadways, facilities or access points. Future infrastructure improvements or increased maintenance could be necessary to address impacts to infrastructure. Projects that upgrade existing infrastructure or add new infrastructure, such as trails, boardwalks, and similar types of public access; and many of the other project types discussed above, would have long-term beneficial impacts to infrastructure.

For this project type, the impacts to infrastructure are adequately analyzed in the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. No utilities or conveyance structures would be impacted. Repairing and upgrading the aging Jeff Friend Trail would have long-term beneficial impacts to infrastructure at the refuge. The addition of the proposed viewing platform would require maintenance and would be added to the existing maintenance done for the Trail by existing refuge staff as part of the ongoing operation of the refuge. No additional use of existing infrastructure is expected except for short-term use of the roads and parking lot during construction. These impacts would be short-term, local and minor.

8.2.6.3.4 Tourism and Recreational Use

Affected Environment

The refuge hosts more than 100,000 visitors annually www.fws.gov/bonsecour Visitor services include a visitor contact station with a small educational display area. Four developed trails are available in the Perdue Unit, highlighting dune, swale, wetland, maritime forest, and scrub habitats. Bon Secour Refuge provides a variety of wildlife-dependent recreational uses, including fishing, wildlife observation, wildlife photography, and environmental education and interpretation. To facilitate these uses, a system of

parking lots, trails, and interpretive structures has been developed. Guided nature walks are held throughout the year along the Jeff Friend trail.

Wildlife observation and photography are two of the top five preferred activities on the refuge. Hiking and backpacking can be considered as a supporting use of wildlife observation and photography. Opportunities to engage in these activities exist at Gulf State Park (10 miles from the refuge), however, in Alabama, the intact dune ecosystem is particularly unique to Bon Secour National Wildlife Refuge.

An estimated 100,000 people visit the refuge each year, and many of these visitors engage in hiking (including walks on the beach). The Jeff Friend Trail is one of the primary areas for this use, and is also a section of the Greater Alabama Trail. The refuge is open seven days per week during daylight hours and these uses could occur anytime during these hours. Most users park at the trailheads or the parking lot on Mobile Street. In addition, many visitors stop by the refuge office to obtain information and use the restroom facilities (www.fws.gov/bonsecour)

Environmental Consequences

No Action

Under the No Action alternative, there would be a minor to moderate, long-term adverse impact to tourism and recreational use of the Jeff Friend Trail at Bon Secour NWR. As the trail continues to deteriorate, visitors would be discouraged from using the area, and the only trail available to disabled visitors would not be accessible. The wildlife viewing platform would not be constructed and visitors would not be afforded an additional opportunity for enhanced wildlife observation, one of the top five preferred activities on the refuge.

Proposed Action

Section 6.6.5 of the Final Phase III ERP/PEIS states, “Recreational enhancement project types that include techniques such as beach re-nourishment, placing materials to create reef structures, and enhancing recreational infrastructure could provide long-term benefits to tourist and recreational uses by improving wildlife habitat, and increasing recreational amenities (such as beach facilities). As a result, these types of projects would enhance wildlife viewing, hunting, beach and waterfront visitors, fishing and tourist experiences and provide additional areas in which to experience these opportunities”.

For this project type, the impacts to tourism and recreation are adequately analyzed in the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. This proposed project would have a minor, short-term adverse impact to recreational activities during construction of the trail and viewing platform. During the 1 to 3 month construction period, visitors would need to use one of the other trails for hiking. However, Jeff Friend Trail connects to the Centennial trail, the latter of which will remain open during the construction period and can be accessed via Pine Beach Trail. Enhancement of an existing trail, and construction of a viewing platform are not expected to significantly increase the number of visitors to the refuge, but is expected to create better

access and an enhanced recreational opportunity for the visitors who would normally come to the refuge.

8.2.6.3.5 Land and Marine Management

Affected Environment

National Wildlife Refuge System Authorities

The USFWS manages the National Wildlife Refuge System. This system is the only nationwide system of federal land managed and protected for wildlife and their habitats. The Bon Secour National Wildlife Refuge is managed as part of this system in accordance with the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, the Refuge Recreation Act of 1962, Executive Order 12996 (Management and General Public Use of the National Wildlife Refuge System), and other relevant legislation, Executive Orders, regulations, and policies. Bon Secour NWR was established for the protection of Neotropical migratory songbird habitat and threatened and endangered species. These species are given priority when implementing management activities. The Bon Secour NWR is divided into five separate management units along the Fort Morgan Peninsula and Little Dauphin Island. The proposed project area is located entirely within the refuge on the eastern boundary of Bon Secour NWR in the Perdue Unit.

Coastal Zone Management

Pursuant to the Coastal Zone Management Act of 1972, federal actions must be consistent with the federally approved coastal management programs for states where the activities would affect a coastal use or resource of the state. The Federal Trustees' consistency determination for this project was submitted to the Alabama Department of Environmental Management (ADEM) on May 21, 2015. Via letter dated June 24, 2015, ADEM concurred with that determination of consistency with the enforceable policies of the Alabama Coastal Area Management Program for these proposed activities. Additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation.

Environmental Consequences

No Action

Under the No Action alternative, benefits to land management from implementing the project would not be realized. A long-term minor adverse impact would be expected from the possibility of future closure of the Jeff Friend Trail due to repairs not being implemented. Regular maintenance activities would continue, but would probably not be sufficient to stop deterioration of the Jeff Friend Trail.

Proposed Action

The Final Phase III ERP/PEIS states that this project type would have varying impacts on land and marine management depending on the type of management or land ownership applicable to the project site. Projects would generally be consistent with the prevailing management plans and direction governing the use of the land and marine areas where the projects would take place; therefore are generally expected to have no adverse impacts to land and marine management.

Projects implemented at national, state and local parks, wildlife refuges, and wildlife management areas could have short-term minor to moderate adverse impacts to land and marine management. These impacts would be temporary, and would occur as a result of construction activities related to projects such as the construction of new roads, trails, boardwalks, and other public access improvements; or the construction of boat ramps, piers, lodging facilities, public restroom, campgrounds, and similar facilities. Impacts would be related to temporary, full or partial closures of parks and refuges. In the long-term, projects would have beneficial impacts on land and marine management at parks and wildlife refuges, and wildlife management areas because these activities would improve public access and amenities, helping park management and staff fulfill their obligations to manage these properties for the benefit of the environment and human enjoyment.

For this project type, the impacts to land and marine management are adequately analyzed in the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. This proposed project would necessitate closure of the Jeff Friend Trail during construction. This impact would be minor, adverse and temporary, and would occur as a result of construction activities related to project. Visitors are expected to use the other trails during construction. The Centennial Trail connects with the Jeff Friend Trail and can be accessed via the Pine Beach Trail. Long-term beneficial impacts to land management are expected due to improvement to the trail and fulfillment of refuge management goals of providing quality educational natural resource oriented experiences for visitors.

8.2.6.3.6 Public Health and Safety and Shoreline Protection

Affected Environment

The Jeff Friend Trail is ten years old. Along the boardwalk area some of the wood has rotted and become unsafe (see Figure 8-4). The gravel area has developed areas where the gravel has settled or washed away in storm events producing an uneven surface. The stabilizing/erosion control material under the gravel has been left exposed in some areas. This makes walking for some individuals or navigating a wheel chair problematic. The proposed project would not affect shoreline protection as the trail already exists and the viewing platform would be located in an area that would have no impacts to the shoreline of Little Lagoon.

Environmental Consequences

No Action

Under the No Action alternative, the boardwalk would continue to deteriorate and could become unnavigable for most visitors. This could result in closure of the trail, or in visitors avoiding the boardwalk area and walking through some of the habitat surrounding the trail.

Proposed Action

Section 6.6.9 of the Final Phase III ERP/PEIS states that this project type "involving construction and construction activities would result in short-term minor adverse impacts to public health and safety as a result of the operation of heavy equipment and construction materials as well as the potential of hazardous waste and materials contaminating soils, groundwater, and surface waters. Projects would be designed using similar safety-related BMPs to reduce hazards".

For this project type, the impacts to public health and safety and shoreline protection are adequately analyzed in the Final Phase III ERP/PEIS. For the proposed project, the impacts would be consistent with the Final Phase III ERP/PEIS analysis. The proposed project would enhance public health and safety by providing a wider, more sturdy and safe boardwalk, and would provide a smoother, more navigable surface of asphalt or compressed rubber material in the existing gravel portion of the trail. Materials are being researched that would provide the best surface for this type of use and that would be less prone to washing away in storm events.

8.2.6.3.7 Summary of Impacts to Human Uses

Under the No Action alternative, the Jeff Friend Trail would not be repaired and enhanced and no construction activities would take place. The raised observation platform would not be built. Regular maintenance on the existing trail would continue, but the trail would continue to deteriorate over time without major repairs. No Action would result in minor to moderate short and long-term impacts to aesthetic and visual resources, infrastructure, tourism and recreation, land and marine management and public safety. The No Action alternative would not impact cultural resources as ground disturbing construction activities would not occur.

Under the Proposed Action, construction activities would create minor to moderate, adverse impacts to aesthetics and visual resources and tourism and recreation due to temporary trail closure. Public safety would not be impacted due to trail closure during construction. Long-term beneficial impacts are anticipated to aesthetics and visual resources due to the improved appearance of the trail and opportunities for viewing the vistas of Little Lagoon from the raised observation platform; however, a minor long-term adverse impact could occur depending on the placement of the raised platform. On balance the visual impacts are expected to be beneficial. No adverse impacts are expected to cultural resources. Surveys would be completed and NHPA Section 106 and Tribal consultations would further identify potential cultural resources in the project area and any mitigation measures necessary to protect those resources.

8.2.7 Cumulative Impacts

As discussed in Chapter 4, the CEQ NEPA regulations require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined as "the impact on the 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" (40 C.F.R. §1508.7).

The Bon Secour Trail Enhancement Project cumulative impacts analysis tiers from the Final Phase III ERP/PEIS. The Final Phase III ERP/PEIS analysis of cumulative impacts relevant to the proposed Bon Secour NWR Trail Enhancement project are incorporated by reference into the following cumulative impacts analysis for the Bon Secour NWR Trail Enhancement project. The Final Phase III ERP/PEIS programmatic analysis describes impacts from implementation of project types, not necessarily specific projects. The Bon Secour Trail Enhancement project falls within the project type "Enhance Public Access to Natural Resources for Recreational Use "as described in that document. The following analysis focuses on the potential contribution of adverse impacts of the proposed Bon Secour NWR Trail Enhancement Project to the impacts of some past, present, and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS.

8.2.7.1 Site Specific Review and Analysis of Cumulative Impacts

This section describes past, present, and reasonably foreseeable future actions that were not discussed in the Final Phase III ERP/PEIS, but which are relevant to identifying any cumulative impacts that the proposed Bon Secour NWR Trail Enhancement Project could contribute to on a local scale. Context and intensity, defined in Section 6.2.4, are used to determine whether a potential significant cumulative impact from the Bon Secour project exists.

For the Bon Secour NWR Trail Enhancement project, specifically, the relevant affected resources analyzed in this EA are:

- Geology and Substrates
- Air Quality
- Noise
- Habitats
- Living Coastal and Marine Resources
- Cultural Resources
- Tourism and Recreation Use
- Aesthetics and Visual Resources
- Public Health and Safety
- Infrastructure

Local and site-specific past, present and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS were identified through conversations with Refuge staff and searching websites relevant to the Bon Secour NWR Trail Enhancement Project. Actions that would be relevant to the Bon Secour Trail Enhancement project cumulative impacts analysis are defined here as those with similar scope, timing, impacts or location. The local action area is defined as Bon Secour NWR and its immediate surroundings. Because of the small scale (context) of the proposed project and potential for temporary, localized (intensity) impacts described in the analyses above, only projects that could be implemented at

roughly the same time as the proposed Jeff Friend trail enhancement project are analyzed here. Websites searched include:

- http://www.nfwf.org/whoweare/mediacenter/pr/Pages/gulf-main-pr-14-1117.aspx
- http://eli-ocean.org/gulf/restoration-projects-database/

A past project, the Early Restoration Phase I Alabama Dune Restoration project located partially on Bon Secour NWR, has been completed and is not considered relevant to this cumulative impacts analysis. The project is located on the opposite side of Little Lagoon and involved planting dune vegetation.

This search provided the following additional information on two actions that are relevant to the Bon Secour Trail Enhancement Project cumulative impacts analysis.

- Replacement of buried electrical wire with new wire in conduit along the Pine Beach Trail. The work should last approximately 30 to 45 days and is planned to start in the spring of 2015, stopping in June. It is planned to begin again in the fall of 2015 for completion.

- Replacement of the bridge on Pine Beach Trail. The work is planned to be done in the spring or summer 2015.

The Bon Secour Trail Enhancement project and both of these actions would require closure of trails during project work. Resource areas where Bon Secour Trail Enhancement Project could have potential to contribute to cumulative impacts are analyzed below.

8.2.7.1.1 Geology and Substrates

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.1 Geology and Substrates. The Final Phase III ERP/PEIS found that when this project type was analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to geology and substrates would likely occur. However, Alternative 3 carried out in conjunction with other environmental stewardship and restoration efforts had the potential to result in some long-term beneficial cumulative impacts to geology and substrates in localized areas. Alternative 3 was not expected to contribute significantly to adverse cumulative impacts. The Bon Secour project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

The analysis in Section 8.2.6.2.1 determined the Bon Secour Trail Enhancement project would have a temporary, minor impact on substrates and no impact on geology. The two Pine Beach Trail infrastructure enhancement projects, replacement of a walking bridge and buried wire replacement are upgrades of existing infrastructure and similar to those analyzed in the Final Phase III ERP/PEIS.

Based on these findings, the Bon Secour NWR Trail Enhancement project is not expected to contribute significantly to adverse cumulative impacts to geology and substrates.

8.2.7.1.2 Air Quality and Greenhouse Gases

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.3, Air Quality and Greenhouse Gases. The Final Phase III ERP/PEIS found that when this project type was analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to air quality and greenhouse gas emissions would likely occur. However, project type would not contribute substantially to cumulative adverse impacts. The analysis found that it was unlikely that there would be any beneficial cumulative impacts to air quality associated with Alternative 3. The Bon Secour project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 8.2.6.2.2, the Bon Secour Trail Enhancement project would have a temporary, minor adverse impact on air quality and GHGs. When taken into consideration with the two Pine Beach Trail infrastructure enhancement projects which are also temporary projects with local impacts, the expected cumulative impacts are consistent with those analyzed in the Final Phase III ERP/PEIS.

Based on these findings, the Bon Secour NWR Trail Enhancement project is not expected to contribute significantly to adverse cumulative impacts to air quality and GHG levels.

8.2.7.1.3 Noise

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.4. The Final Phase III ERP/PEIS found that when Alternative 3 is analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 3 would not contribute substantially to short-term or long-term cumulative adverse impacts to noise. Because it had little effect on noise over the long-term, Alternative 3 was not expected to substantially contribute to beneficial cumulative impacts to noise in the Gulf Coast region. The Bon Secour project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 8.2.6.2.3, the Bon Secour Trail Enhancement project is anticipated to have a minor, short-term impact on noise levels. Because of the local nature of the two Pine Beach Trail infrastructure enhancement projects, if construction and human activity were occurring at the same time, work on the Jeff Friend Trail would contribute to noise levels on the Bon Secour NWR. This could potentially cause short-term moderate levels of noise in the area. Scheduling the projects so that the noisiest activities are not done at the same time could mitigate the noise; however, the Pine Beach Trail work is located approximately a half mile from the proposed Jeff Friend Trail work, also minimizing noise levels.

Based on these findings, the Bon Secour NWR Trail Enhancement project is not expected to contribute significantly to adverse cumulative impacts on noise levels.

8.2.7.1.4 Living Coastal and Marine Resources

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.2.2, Living Coastal and Marine Resources. The Final Phase III ERP/PEIS found that when this project type was analyzed in combination

with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to living coastal and marine resources would likely occur. However, this project type would not contribute substantially to cumulative adverse impacts. This project type carried out in conjunction with other environmental stewardship and restoration efforts was found to have the potential to result in some long-term beneficial cumulative impacts to living coastal and marine resources, primarily as a result of increased education and awareness of resources. The Bon Secour project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 8.2.6.3.1, the Bon Secour Trail Enhancement project is not likely to adversely affect piping plover and red knot, and would not affect other protected species. The proposed project would not contribute to adverse impacts to habitats as there would be no removal of shrubs, grass or trees. Mitigation measures would be implemented to protect habitats during construction. Visitors walking on a safe, easily accessible trail would be less likely to walk through adjacent sandy habitat and vegetated areas. This proposed project is expected to have minor long-term beneficial impacts on living coastal and marine resources. Therefore, adverse impacts would not be contributed to impacts from the two Pine Beach Trail infrastructure enhancement projects.

Based on these findings, the Bon Secour NWR Trail Enhancement project is not expected to contribute significantly to adverse cumulative impacts to living coastal and marine resources.

8.2.7.1.5 Cultural Resources

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.2 Cultural Resources. The Final Phase III ERP/PEIS found that when Alternative 3 was analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to cultural resources would likely occur. However, Alternative 3 was not expected to contribute substantially to short-term or long-term adverse or beneficial cumulative impacts to cultural resources.

As described in Section 8.2.6.4.1, the Bon Secour Trail Enhancement project is not anticipated to impact cultural resources. Therefore, adverse impacts from the Jeff Friend Trail enhancement would not be contributed to impacts from the two Pine Beach Trail infrastructure enhancement projects.

Based on these findings, the Bon Secour NWR Trail Enhancement project is not expected to contribute significantly to adverse cumulative impacts to living coastal and marine resources.

8.2.7.1.6 Land and Marine Management

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.4, Land and Marine Management. The Final Phase III ERP/PEIS found that when Alternative 3 was analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 3 would not contribute substantially to short-term or long-term cumulative adverse impacts to land and marine management. Alternative 3 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to land and marine management in the Gulf Coast region

because of the potential for synergistic effects of Alternative 3 project types with these other environmental stewardship and restoration activities leading to the alignment of management goals and assistance provided to management and staff to best manage properties from restoration, conservation and recovery efforts. The Bon Secour project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 8.2.6.4.5, the Bon Secour Trail Enhancement project is anticipated to have a minor, short-term adverse impact on land and marine management, lasting during construction activities. Long-term beneficial impacts to land management are expected due to improvement to the trail and fulfillment of refuge management goals of providing quality educational natural resource oriented experiences for visitors.

Based on these findings, the Bon Secour NWR Trail Enhancement project is not expected to contribute significantly to adverse cumulative impacts to land and marine management.

8.2.7.1.7 Infrastructure

As described in Section 8.2.6.4.3, upgrading the aging Jeff Friend Trail would have long-term beneficial impacts to infrastructure at the refuge. Use of the roads and parking lots during construction would cause a short-term, minor adverse effect. The two Pine Beach Trail infrastructure enhancement projects, replacement of a walking bridge and buried wire replacement are upgrades of existing infrastructure. Therefore the Bon Secour NWR Jeff Friend Trail Enhancement Project would contribute to long-term beneficial impacts to the infrastructure of the refuge.

Based on these findings, the Bon Secour NWR Trail Enhancement project is not expected to contribute to adverse cumulative impacts to refuge infrastructure.

8.2.7.1.8 Tourism and Recreational Use

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.5.The Final Phase III ERP/PEIS found that when this project type was analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to tourism and recreational use would likely occur. However, this project type would not contribute substantially to cumulative adverse impacts. This project type carried out in conjunction with other environmental stewardship and restoration efforts was found to have the potential to result in some long-term beneficial cumulative impacts to tourism and recreational use in localized areas.

As described in Section 8.2.6.4.4, the Bon Secour Trail Enhancement project is anticipated to have a minor, short-term adverse impact and long-term beneficial impacts on tourism and recreational use. The work on the Jeff Friend Trail and the two Pine Beach Trail infrastructure enhancement projects would necessitate closure of the trails during work. There are four trails at Bon Secour NWR. If the Pine Beach Trail was closed at the same time, work on the Jeff Friend Trail could cause a moderate short-term adverse impact to recreational use at Bon Secour NWR. Long-term beneficial cumulative impacts are anticipated to recreational use at Bon Secour NWR after the proposed project is completed.

Based on these findings, the Bon Secour NWR Trail Enhancement project is not expected to contribute significantly to adverse cumulative impacts to tourism and recreational use.

8.2.7.1.9 Aesthetics and Visual Resources

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.8, Aesthetics and Visual Resources, Table 6-17. The Final Phase III ERP/PEIS found that when Alternative 3 was analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to aesthetics and visual resources would likely occur. However, Alternative 3 would not contribute substantially to cumulative adverse impacts. Alternative 3 carried out in conjunction with other environmental stewardship and restoration efforts was found to have the potential to result in some long-term beneficial cumulative impacts to aesthetics and visual resources in localized areas.

As described in Section 8.2.6.4.2, the Bon Secour Trail Enhancement project could a minor, long-term impact on aesthetic and visual resources, depending on the placement of the observation platform. Work on the trail itself would have long-term beneficial impacts from enhancements to the trail's appearance. When taken into consideration with the two Pine Beach Trail infrastructure enhancement projects, the minor, long-term adverse visual impact is balanced by the beneficial impacts of project.

Based on these findings, the Bon Secour NWR Trail Enhancement project is not expected to contribute significantly to adverse cumulative impacts to aesthetics and visual resources.

8.2.7.1.10 Public Health and Safety

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.3.9, Public Health and Safety. The Final Phase III ERP/PEIS found that when Alternative 3 was analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to public health and safety would likely occur. However, Alternative 3 would not contribute substantially to cumulative adverse impacts. Alternative 3 carried out in conjunction with other environmental stewardship and restoration efforts was found to have the potential to result in some long-term beneficial cumulative impacts to public health and safety in localized areas.

As described in Section 8.2.6.4.6, the Bon Secour Trail Enhancement project is anticipated to have no effect during construction, and a long-term (life of the project) beneficial impact to public health and safety. Therefore, adverse impacts would not be contributed to impacts from the two Pine Beach Trail infrastructure enhancement projects.

Based on these findings, the Bon Secour NWR Trail Enhancement project is not expected to contribute significantly to adverse cumulative impacts to aesthetics and visual resources.

8.2.7.2 Phase IV Projects

Due to the small scale, minor, local and temporary impacts from the project, the Bon Secour Trail Enhancement Project is not anticipated to contribute to potential adverse cumulative impacts in combination with other Phase IV projects. In terms of location, the closest Phase IV proposed project to

Bon Secour NWR is the Alabama Osprey Nesting Project. That project consists of erecting five osprey nesting platforms along coastal Alabama, with the closest location to Bon Secour being in the Little Lagoon area. Cumulatively, the two Pine Beach Trail infrastructure enhancement projects, with the Phase IV Alabama Osprey Nesting Project, would not produce significant, adverse cumulative impacts.

Accordingly, the Bon Secour NWR Trail Enhancement Project would not contribute adverse cumulative impacts to any of the resources analyzed when added to past, present or reasonably foreseeable future actions.

8.2.8 Summary and Next Steps

The proposed Bon Secour Trail Enhancement project would repair and enhance aging trail infrastructure at the existing Jeff Friend Trail on the Bon Secour NWR in Alabama. It would also provide a raised viewing platform that would be handicap accessible. The proposed project is consistent with the Final Phase III ERP PEIS programmatic Alternative 4, "Contribute to Restoring Habitats, Living Coastal and Marine Resources, and Recreational Opportunities" (Preferred Alternative). Under the programmatic Preferred Alternative, the proposed project falls within the scope of the project type "Enhance Public Access to Natural Resources for Recreational Use".

NEPA analysis of the environmental consequences suggests that there would be local minor, short-term adverse impacts from construction activities to some resources (noise, air quality, substrates, land management, and infrastructure). Local moderate, short-term impacts could occur to tourism and recreation, and aesthetics and visual resources; however, long-term benefits are expected for those resources after construction is complete. Habitats would not be adversely impacted by the proposed construction and could benefit from visitors staying on the trail and not walking through habitat next to the trail to avoid areas of the trail in disrepair. Guided nature walks that educate the public on the importance of the habitats and other natural resources found on the Bon Secour NWR are conducted on the Jeff Friend Trail. No adverse cumulative impacts from the proposed project are anticipated. Overall, this project would enhance recreational opportunities on the Bon Secour NWR.

This proposed project will be implemented in accordance with all applicable laws and regulations. Endangered Species Act Section 7 consultation with the USFWS has been completed and the USFWS concurred that no threatened, endangered, or candidate species or critical habitat would be adversely affected as a result of implementing this project. The project was also reviewed for impacts to bald eagles and migratory birds in accordance with the BGEPA of 1940 and the MBTA , and determined take would be avoided (DOI 2015).

The Trustees have initiated coordination and review under Section 106 of the NHPA. A complete review of this project will be completed prior to project implementation. NHPA Section 106 and Tribal consultations may further identify potential cultural resources in the project areas and any mitigation measures necessary to protect those resources.

Pursuant to the CZMA, federal Trustees submitted consistency determinations for state review coincident with public review of this document. ADEM concurred with that determination of consistency

with the enforceable policies of the Alabama Coastal Area Management Program for these proposed activities. Additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation.

If any further need arises to coordinate and consult with other regulatory authorities, the additional coordination or consultation requirements will be addressed prior to project implementation.

The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. Public comments and Trustee responses are found in Chapter 15.

8.3 References

CEQ 2014. Final Guidance for Effective Use of Programmatic NEPA Reviews, 79 FR 76986, December 23, 2014.

CEQ 2014. Revised Draft Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews, 79 FR 77801 December 24, 2014.

DOI 2014. Programmatic and Phase III Early Restoration Plan and Programmatic Environmental Impact Statement.

DOI 2015. Informal consultation and conference request for the proposed Bon Secour NWR Trail Enhancement Project, Alabama. March 27, 2015. 2 pp. + Attachment.

USFWS 2005. Bon Secour National Wildlife Refuge Comprehensive Conservation Plan.

USFWS 2008. Eastern Indigo Snake (*Drymarchon couperi*) 5-year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Southeast Region, Mississippi Ecological Services Field Office, Jackson, Mississippi. pp. 33.

USFWS 2015. Informal consultation and conference for the proposed Bon Secour NWR Trail Enhancement project, Gulf Shores, AL. Alabama Ecological Services Field Office. Reference Number 2015-I-0430. April 10, 2015. 1 pp.

Chapter 9: Osprey Restoration in Coastal Alabama

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9.1 Osprey Restoration in Coastal Alabama: Project Description

9.1.1 Project Summary

The restoration project will install five osprey nesting platforms along the coast in Mobile and Baldwin Counties, Alabama in order to provide enhanced nesting opportunities for piscivorous raptors, including osprey.

9.1.2 Background and Project Description

This project seeks to compensate the losses to natural resources resulting from the Spill by establishing five osprey nesting platforms in Mobile and Baldwin Counties in coastal Alabama. The specific locations and design of these nesting platforms will be developed to maximize project success and meet regulatory requirements. Five general areas have been identified for the location of these platforms (Figure 9-1) (from west to east): the vicinity of Portersville Bay, the vicinity of Dauphin Island, the vicinity of Fort Morgan, the vicinity of the Little Lagoon in Gulf Shores, and in Gulf State Park (Figures 9-2 through 9-6).

Osprey (*Pandion haliaetus*) occur in the southeastern and western coastal areas, the northern states, and the Pacific Northwest. Some osprey migrate to winter in Central and South America, while others spend their winters in Florida and southern California (University of Georgia, 2008). In Alabama, osprey can be found in the spring, summer, and fall, and are uncommon in winter. This species is typically found on lakes, rivers, and bays (ADCNR, 2014). Osprey require nest sites in open surroundings for easy approach, with a wide, sturdy base and safety from ground predators (such as raccoons). Nests are usually built on snags, treetops, or at the junction of large branches and trunks, on cliffs, or human-built platforms. The osprey readily builds its nest on manmade structures in suitable habitat areas, such as telephone poles, channel markers, duck blinds, and nest platforms designed especially for it (Figures 9-6 and 9-7). In some areas, nests are placed almost exclusively on artificial structures (Cornell, 2015).

Figure 9-1. Potential Platform Location Overview

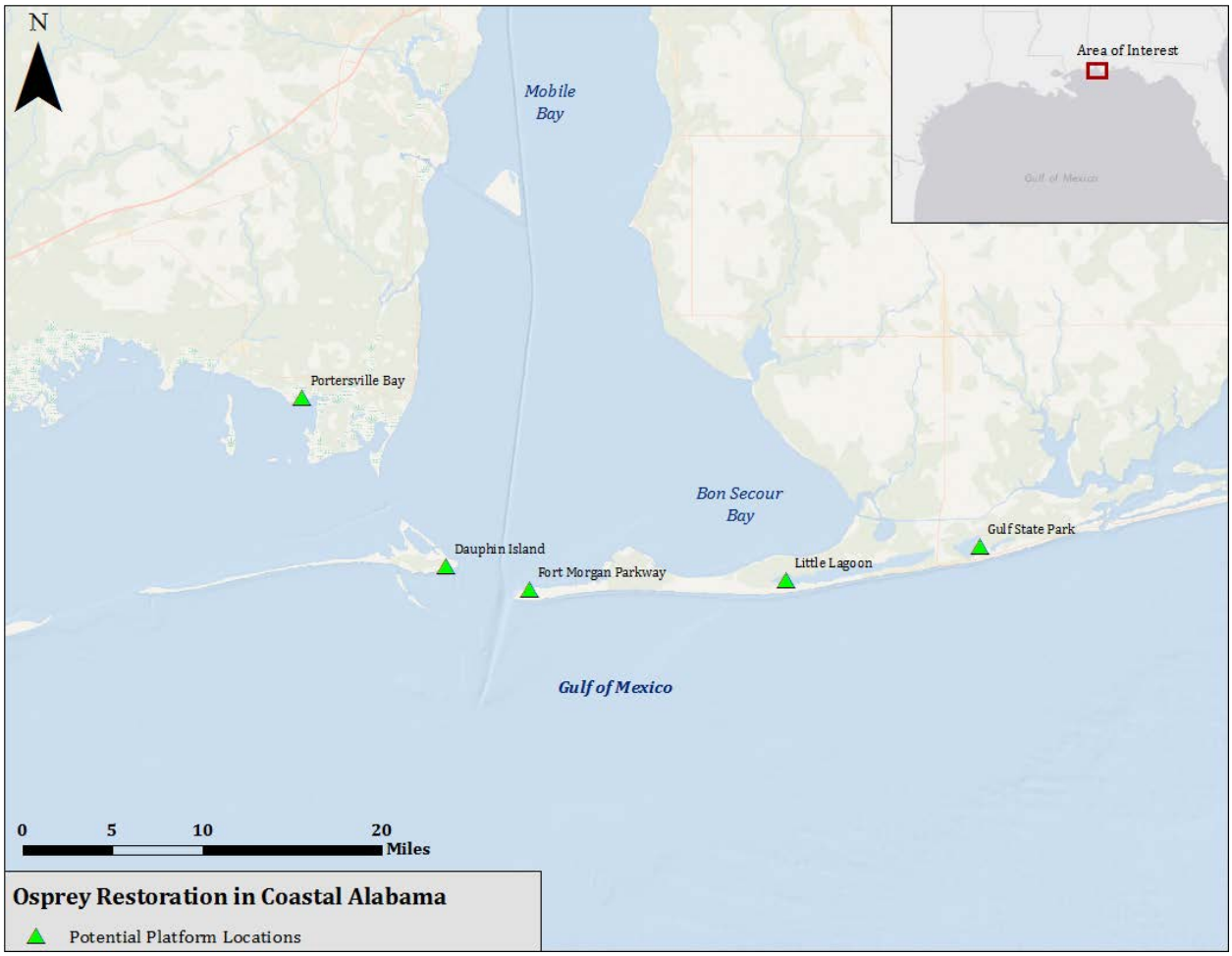


Figure 9-2. Potential Osprey Restoration Target Platform Areas in the Vicinity of Portersville Bay



Figure 9-3. Potential Osprey Restoration Target Platform Areas in the Vicinity of Dauphin Island



Figure 9-4. Potential Osprey Restoration Target Platform Areas in the Vicinity of Fort Morgan



Figure 9-5. Potential Osprey Restoration Target Platform Areas in the Vicinity of Little Lagoon, Gulf Shores



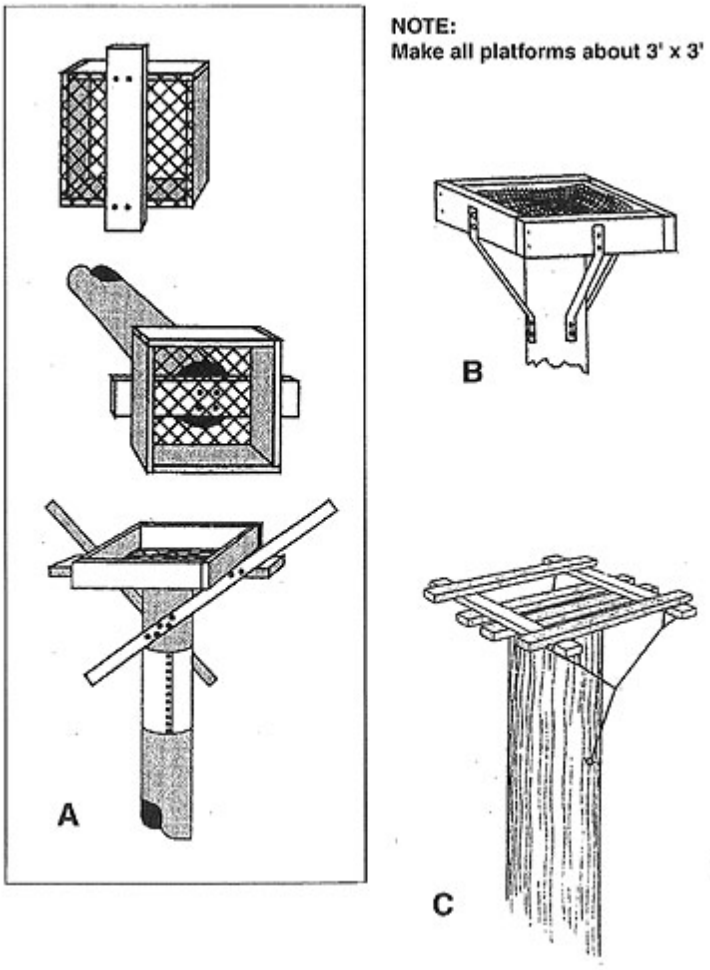
Figure 9-6. Potential Osprey Restoration Target Platform Areas in Gulf State Park



Figure 9-7. View of Typical Osprey Nesting Platform



Figure 9-8. Dimensions of Typical Osprey Nesting Platform



9.1.3 Evaluation Criteria

This project meets the evaluation criteria established by OPA regulations and the Framework Agreement. The project will enhance piscivorous raptor nesting habitat along coastal Alabama, resulting in increased nesting success and helping to offset adverse impacts to piscivorous raptors caused by the Spill. Thus, the nexus to resources injured by the Spill is clear (see 15 C.F.R. § 990.54(a)(2) and Sections 6a-6c of the Early Restoration Framework Agreement).

The project is technically feasible, utilizes commonly used restoration techniques, and can be implemented with minimal delay. This project will use nesting platforms similar to those already used in coastal Alabama. For these reasons, the project has a high likelihood of success (see 15 C.F.R. § 990.54(a)(3) and Section 6e of the Early Restoration Framework Agreement).

A thorough environmental assessment, including review under applicable environmental statutes and regulations, is described in Section 9.2. That preliminary review indicates that adverse effects from the project will largely be minor, localized, and of short duration. In addition, the best management

practices and measures to avoid or minimize adverse effects described in each section in the environmental assessment would be implemented. As a result, collateral injury will be avoided and minimized during project implementation (15 C.F.R. § 990.54(a)(4)).

Cost estimates are based on similar past projects, and adjusted based on-site specific considerations for this project. Based on these estimates and best professional judgment the project can be conducted at a reasonable cost. (See 15 C.F.R. § 990.54(a)(1)). As a result, the project is considered feasible and cost effective. The project is not inconsistent with long-term restoration needs (see 15 C.F.R. § 990.54(a)(1),(3), and Sections 6d-6e of the Early Restoration Framework Agreement).

9.1.4 Performance Criteria and Monitoring

The restoration goal of this project is to enhance osprey nesting habitat in coastal Alabama. This will be accomplished by the establishment of five nesting platforms. The project will be deemed successful when the goal of installing five platforms to provide additional habitat is accomplished. Nests will be monitored after construction according to the monitoring plan in Appendix B.

9.1.5 Maintenance

There will be no anticipated long-term maintenance activities required due to the simple nature of these structures. In the event that the structures are damaged from a severe weather event, they may be replaced, contingent on available funding. However, based on experience with similar structures along the gulf coast, these structures have been able to withstand severe weather events.

9.1.6 Offsets

For purposes of negotiating Offsets with BP in accordance with the Framework Agreement, the Trustees used a Resource Equivalency Analysis to estimate bird Offsets. The Trustees and BP agreed that if this restoration project is selected for implementation, BP will receive Offsets of 168 discounted bird years for piscivorous raptors, applicable only to piscivorous raptor injuries, as determined by the Trustees' total assessment of injury for the Spill. Piscivorous raptor(s) means osprey (*Pandion haliaetus*) and bald eagle (*Haliaeetus leucocephalus*) for purposes of this Offset.

9.1.7 Estimated Cost

The estimated cost for this project is $45,000. This cost reflects cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, design, implementation, and monitoring.

9.2 Osprey Restoration in Coastal Alabama: Environmental Assessment

The proposed restoration project would install five osprey nesting platforms along the coast in Mobile and Baldwin Counties, Alabama to provide enhanced nesting opportunities for osprey.

9.2.1 Introduction, Background, Purpose and Need

The CEQ encourages federal agencies to "tier" their NEPA analyses from other applicable NEPA documents to create efficiency and reduce redundancy, and has issued new guidance on the use of programmatic NEPA documents for tiering (CEQ 2014).

Tiering has the advantage of not repeating information that has already been considered at the programmatic level so as to focus and expedite the preparation of the tiered NEPA review(s). When a programmatic environmental assessment (PEA) or PEIS has been prepared, and an action is one that is anticipated in, consistent with, and sufficiently explored within the programmatic NEPA review, the agency need only summarize the issues discussed in the broader statement, incorporate discussion from the broader statement by reference, and concentrate on the issues specific to the subsequent tiered proposal (CEQ 2014).

A federal agency may prepare a PEIS to evaluate broad actions (40 C.F.R. § 1502.4(b); see Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18026 (1981)). When a federal agency prepares a PEIS, the agency may "tier" subsequent narrower environmental analyses on site-specific plans or projects from the PEIS (40 C.F.R. § 1502.4(b); 40 C.F.R. §1508.28). Federal agencies are encouraged to tier subsequent narrower analyses from a PEIS to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review (40 C.F.R. § 1502.20). The 2014 Final Programmatic and Phase III Early Restoration Plan and Programmatic Environmental Impact Statement (Final Phase III ERP/PEIS) was prepared for use in tiering subsequent early restoration plans and projects, such as Phase IV.

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the Final Phase III ERP/PEIS. This EA qualifies for tiering from the Final Phase III ERP/PEIS in accordance with Department of the Interior regulations (43 C.F.R. § 46.140, Using Tiered Documents, b and c).

This project is consistent with the Final Phase III ERP/PEIS' Preferred Alternative as described in the 2014 Record of Decision (79 FR 64831-64832 (October 31, 2014)) and the Trustees find that the conditions and environmental effects described in the broader NEPA document (with updates as described in Chapter 2 of this Phase IV DERP/EA) are valid. Specifically, this project tiers from the analyses found in sections of the PEIS that describe:

- Alternative 4 (Preferred Alternative: Contribute to Restoring Habitats, Living Coastal and Marine Resources and Recreational Opportunities)
- Early Restoration Programmatic Plan - Development and Evaluation of Alternatives
- Section 5.3.5.1, and

- Environmental Consequences, Section 6.3.8, and Project Type 8: Restore and Protect Birds, Create/Enhance Bird Nesting and/or Foraging Habitat.

This EA incorporates by reference the analysis found in the PEIS in those sections. This EA also incorporates by reference all Early Restoration introductory, process, background, and affected environment information and discussion provided in the PEIS (Chapters 1 through 6).

9.2.1.1 Background

As natural nesting sites, (i.e., tree snags) are removed along developed coastlines, nesting platforms such as the structures proposed in this project provide important alternative nesting structures. When platforms are placed within view of suitable fishing habitat for the osprey and predator guards are placed on the poles to limit access to the nest by predators, the species benefits.

This project seeks to partially compensate for piscivorous raptor losses resulting from the Spill by establishing five osprey nesting platforms in Mobile and Baldwin Counties in coastal Alabama. The specific locations and design of these nesting platforms would be developed to maximize project success and meet regulatory requirements.

9.2.1.2 Purpose and Need

The purpose and need for this action falls within the scope of the purpose and need of the programmatic portions of the Final Phase III ERP/PEIS because it would accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. The proposed project's purpose is to partially restore piscivorous raptors injured as a result of the *Deepwater Horizon* incident. The proposed project's purpose is to enhance osprey nesting in coastal Alabama. The proposed project is needed to provide enhanced nesting opportunities with reduced likelihood of nest predation for osprey in coastal areas.

9.2.2 Scope of the EA

This project is proposed as part of Phase IV of Early Restoration. This EA tiers from the programmatic portions of the Final Phase III ERP/PEIS. The broader environmental analyses of these types of actions as a whole are discussed in the Final Phase III ERP/PEIS from which this EA is tiered. The information and analyses in this document supplements the programmatic analyses with site-specific information. This EA provides NEPA analysis for potential impacts for site specific issues and concerns anticipated from implementation of the proposed action and the No Action Alternative.

The Trustees' Early Restoration project selection process is described in Section 2.1 of the Final Phase III ERP/PEIS. As described there, potential projects evolve from public scoping, ongoing public input through internet-accessible databases, review of current Federal and State management plans and programs, and Trustee expertise and experience. From this broad list of project ideas, the Trustee's Early Restoration project selection process initially results in a set of proposed projects that, consistent

with the Framework Agreement, are submitted to BP for review and consideration. One project type considered for Early Restoration includes restoration benefiting bird resources impacted by the Spill.

9.2.3 Project Alternatives – No Action Alternative

Both OPA and NEPA require consideration of the No Action Alternative. For this section, there are two alternatives, the No Action Alternative and the Proposed Action, Osprey Restoration in Coastal Alabama.

Under the No Action Alternative the Trustees would not pursue Osprey Restoration in Coastal Alabama as part of Phase IV Early Restoration. Under the No Action Alternative, the existing conditions described in Chapter 3 of the Final Phase III ERP/PEIS would prevail. Restoration benefits associated with this project would not be achieved at this time.

9.2.4 Project Alternatives – Proposed Action

9.2.4.1 Project Location

The project proposes installation of five osprey nesting platforms along the coast in Mobile and Baldwin Counties, Alabama. Five general areas have been identified for the location of these platforms (from west to east): the vicinity of Portersville Bay, the vicinity of Dauphin Island, the vicinity of Fort Morgan, the vicinity of the Little Lagoon in Gulf Shores, and in Gulf State Park (Figures 9-2 through 9-6).

9.2.4.2 Project Scope

Figure 9-7 and Figure 9-8 illustrate typical osprey nesting platforms. A typical design for such structures is a 3 foot by 3 foot nesting platform atop a pole approximately 10 to 20 feet high. Poles are typically placed 3 to 6 feet deep in the ground. Sheet metal would be attached to the pole approximately 3 to 6 feet above the ground to prevent predators such as raccoons from climbing the pole to access the nests.

While the exact locations for siting the nesting platforms in the above areas have not yet been determined, the following areas would be avoided:

- Any area with cultural resource artifacts determined significant in coordination with the Alabama Historic Commission (AHC).
- While wetland habitats could be utilized (with proper regulatory compliance), open water siting would be avoided.
- Areas in proximity to bald eagle (*Haliaeetus leucocephalus*) nests (the guidance of the Bald and Golden Eagle Protection Act would be followed).
- Areas used by listed species or designated as critical habitat would be avoided.
- Any other areas that are identified as unsuitable during the compliance process.

Installation of the proposed project is estimated to take approximately 6 months and would include the following activities:

- Planning, site investigations, and design for the installation of the platforms - approximately 2 months, concurrently it would take approximately 3 months to complete the contracting for this effort.
- Obtain any required permits and consultations (concurrent with planning and design) – 3-4 months
- Construction – Over a 3 month period, with construction at individual sites lasting less than a day.

Construction would likely occur using a standard power pole placement truck, with auger and boom. A second truck would be utilized to transport the poles. Construction activity at each site is expected to last less than one day, approximately two hours.

Existing roads and/or uplands would be used to access the sites, to the maximum extent practicable. A long-arm bucket truck and/or similar equipment would be used to place the nesting platform support pole in the ground. Poles may be placed in either uplands or wetlands; however the only disturbance to the site would be an approximately 3 foot by 3 foot area where the hole for the support pole would be augured. If a platform is placed in wetlands, no vehicles would be operated in or through wetlands. The platform would be placed within reach of the vehicle boom.

No permanent impacts other than the footprint of the pole would occur. Any soil remaining from the auguring of the hole would be spread in a thin layer around the pole or, in the case of poles placed in wetlands, remaining soil would be removed and placed in adjacent uplands.

The total estimated project cost is $45,000. No regular maintenance activities would be anticipated due to the simple nature of these structures. Should they be damaged by a storm event, the ADCNR would look into replacing the structures, contingent upon available funding.

9.2.5 Affected Environment and Environmental Consequences

Under the NEPA, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

In order to determine whether an action has the potential to result in significant impacts, the **context and intensity** of the action must be considered. **Context** refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). **Intensity** refers to the severity of impact, and could include the timing of the action (e.g., more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse.

For purposes of this document, impacts are characterized as minor, moderate or major, and temporary or long-term. The analysis of beneficial impacts focuses on the duration (short- or long-term), without

attempting to specify the intensity of the benefit. The definition of these characterizations is consistent with that used in the Final Phase III ERP/PEIS, and can be found in Appendix D

According to the CEQ Regulations for Implementing NEPA (Section 1502.1 and 1502.2) agencies should "focus on significant environmental issues" and for other than significant issues there should be "only enough discussion to show why more study is not warranted." After preliminary investigation, some resource areas were determined to be either unaffected or minimally affected by the proposed action. These resources are discussed briefly below. Only those resource areas with potential, adverse impacts are discussed in detail in this EA.

The programmatic analysis looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resources that are not expected to be affected are simply not evaluated further under a given project. Resource areas not analyzed in detail here along with a brief rationale for non-inclusion are:

- Coastal Waters and Water Quality: Siting of the osprey nesting platforms would not occur in coastal waters, therefore, there would be no impacts to this resource. In regards to water quality, states are required to establish and adhere to water quality standards, per the Clean Water Act (CWA). In Alabama, the Alabama Department of Environmental Management (ADEM) is responsible for establishing water quality standards, controlling discharges into surface and subsurface waters, developing waste treatment management plans and practices, and issuing permits for discharges of dredge and fill material into the waters of the United States. The ADEM routinely collects water samples from 25 potentially high risk public recreational sites from Perdido Bay to Dauphin Island (ADEM 2015). As of February 2015, all sites are considered acceptable. Because construction and operation activities are not expected to result in increased sedimentation or other runoff, impacts to water quality would either not occur or be short-term, localized, and negligible, and so this resource area was not carried forward for detailed analysis. Potential impacts to inland waters and wetlands are discussed below under Hydrology.

- Air Quality and Green House Gas Emissions (GHGs): The Mobile Bay area, including both Mobile and Baldwin counties, is currently in attainment[1] with National Ambient Air Quality Standards required by the U.S. EPA. While construction activities associated with the proposed project have the potential to produce dust, and would result in short-term increases in vehicle emissions along the travel routes to the proposed platform sites, these emissions would be minimal and last only during the less than one day construction period at each of the sites.

[1] The Green Book Nonattainment Areas for Criteria Pollutants, U.S. Environmental Protection Agency, 2015.

There would be no emissions as a result of operation. GHG emissions would result from the construction of the proposed platforms due to the use of materials transport and installation equipment. On December 18, 2014, the Council on Environmental Quality (CEQ) released revised draft guidance that describes how federal departments and agencies should consider the effects of greenhouse gas emissions and climate change in their NEPA reviews.[2] This guidance recommends that agencies consider 25,000 metric tons of carbon dioxide equivalent emissions on an annual basis as a reference point below which a quantitative analysis of greenhouse gas is not recommended. Because of the scale of the proposed project and the limited construction equipment requirements, construction of the project is expected to generate far less GHG than the 25,000 metric tons of carbon dioxide equivalent emission suggested by CEQ for quantitative analysis. Because these impacts are expected to be negligible, this topic is not carried forward for detailed analysis in this assessment.

- Submerged Aquatic Vegetation (SAV): SAV consists of submerged rooted vascular plants that grow in fresh, brackish, and saltwater habitats. SAV beds provide important foraging grounds and nursery habitat for many species in the Gulf of Mexico including nearly all managed fisheries (Thayer, et al. 2003). The platforms would not be installed in open water environments, or in any environment where SAV is present. Further, access to the sites would not be provided through any areas with SAV. Because these plants would not be impacted by the construction or operation of this action, this topic is not carried forward for detailed analysis in this assessment.

- Essential Fish Habitat (EFH): Amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) in 1996 set forth a mandate for the National Marine Fisheries Service, regional Fishery Management Councils (FMC), and other federal agencies to identify and protect EFH of economically important marine and estuarine fisheries. To achieve this goal, suitable fishery habitats need to be maintained. EFH in the project's area of effect is identified and described for various life stages of 55 managed fish and shellfish (GMFMC 1998). A provision of the MSFCMA requires that FMC's identify and protect EFH for every species managed by a Fishery Management Plan (FMP) (U.S.C. 1853(a)(7)).There are FMPs in the Gulf region for shrimp, red drum, reef fishes, coastal migratory pelagics, and highly migratory species (e.g., sharks). The proposed platforms would not be installed in any environment including EFH. Further, access to the sites would not be provided through any areas with EFH. Because these animals would not be impacted by the construction or operation of this action, this topic is not carried forward for detailed analysis in this assessment. The National Oceanic and Atmospheric Administration determined on August 14, 2015 that the proposed Osprey Restoration in Coastal

[2] Draft Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews, Council on Environmental Quality, December 2014.

Alabama will have No Adverse Impacts to EFH under the jurisdiction of National Marine Fisheries Service and, as such, will not require further EFH (NOAA 2015).

- Socioeconomics/Environmental Justice: The socioeconomic environment consists of demographics, the local and regional economy, and environmental justice. Executive Order 12898 (General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) requires all agencies to incorporate these topics into their environmental assessments by identifying and addressing disproportionately high and adverse human health or environmental effects of their proposed actions on minorities and low-income populations or communities. Neither alternative would result in a net change of the current racial and ethnic composition, existing industries, or employment in Mobile and Baldwin counties. Furthermore, no environmental effects on minorities or low-income populations—as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996)—are expected. Therefore, the socioeconomic environment is not carried forward for detailed analysis in this assessment.

- Public Health and Safety and Shoreline Protection: The proposed platforms would be sited near Alabama shorelines. These shorelines contain a number of boat launch areas, and adjacent lands have existing road networks. Any disturbances from this project would occur within the established road network, with limited potential for the public to encounter hazardous material. No chemical waste would be created during construction. Any hazardous material from machinery would be contained through appropriate barriers to prevent potential spills and leaks. Because health and safety measures would be followed during construction, this impact topic is not carried forward for detailed analysis this assessment.

- Infrastructure: Construction of the proposed platforms would generate very little demand on utilities for all project elements. Demand on electricity would be limited to small power tools which would not exceed existing capacity. Power for machinery would be supplied by burning readily available fossil fuel. Water needed for construction processes and for workers' needs would be minimal and would be well within the capacity of existing supplies. Though the presence of two haul trucks on affected roadways could slow the movement of other users, disruption to their travel patterns is unlikely. Once in operation, there would be no demand on local utilities or interference with utilities. Adverse effects to existing infrastructure would be negligible, and is therefore not carried forward for detailed analysis this assessment.

- Land and Marine Management: Installation of each tower would take less than one day. While very short-term impacts to accessing adjacent land uses could occur during that time, they would be considered minimal. The operation of the nesting platforms would not change existing or adjacent land uses and therefore this topic is not carried forward for detailed analysis in this assessment.

- Tourism and Recreation: The proposed project areas along the coast and the surrounding towns host numerous tourist and recreational activities. These include, but are not limited to, wildlife

viewing, biking, birding, boating, camping, cruises, fishing, hiking, hunting, and swimming. Installation of each tower would take less than one day. While very short-term impacts to accessing adjacent land uses could occur during that time, they would be considered minimal. Once constructed, sites would remain accessible, and over the long term, in addition to the ecological benefits provided, the proposed action would enhance opportunities for people to view osprey resulting in beneficial impacts to recreation and tourism. Because access would still be provided to the sites and the recreational benefits of the site enhanced, this topic is not carried forward for detailed analysis in this assessment.

For those resources carried forward for detailed analysis, the analysis first considers if the impacts of the proposed project are within the impacts evaluated for the project type within the Final Phase III ERP/PEIS. After consideration of the projects potential impacts against the programmatic document, site specific impacts are evaluated.

9.2.5.1 Physical Environment

Geology and Substrates

Affected Environment

Mobile and Baldwin Counties fall within the Southern Pine Hills division of the East Gulf Coastal Plain. This plain is underlain by Mesozoic and Cenozoic sedimentary rocks consisting of sand, gravel, silt, chalk, limestone, and sandstone (Davis 1987). The area is considered low risk for seismic activity (USGS 2012). Each target platform area contains a number of soil series, commonly defined as a group of polypedons that have horizons similar in arrangement and in differentiating characteristics (Soil Survey Division Staff 1993). For each area below, the dominant soil series are described in detail (Soil Survey Division Staff 2008).

Portersville Bay

Axis mucky sandy clay loam, 0 to 1 percent slopes. The Axis series consists of deep, very poorly drained, moderately permeable soils that formed in thick loamy marine sediments. These soils are on narrow to broad, level coastal marshes. The water table fluctuates with the tide.

Bayou-Escambia association, gently undulating. This association consists of moderately to poorly drained soils found on broad flats adjacent to drainage ways and undulating ridges.

Dauphin Island

Osier loamy sand, 0 to 2 percent slopes. Osier series consists of very deep, poorly drained, rapidly permeable soils on flood plains or low stream terraces. They formed in sandy alluvium. Osier soils are on flood plains, depressions, or rarely on stream terraces of the Coastal Plain.

Pactolus loamy sand, 0 to 2 percent slopes. The Pactolus series consists of moderately well drained soils with rapid permeability and low water capacity. They are rarely subject to flooding. Pactolus soils are found on broad, smooth flats of uplands and on terraces of small streams.

Fripp sand, rolling. The Fripp series consists of very deep, excessively drained, rapidly permeable soils that formed in thick sandy sediments adjoining beaches and waterways along the coast. They are rarely subject to flooding. The soils are in undulating to steep topography near the seacoast.

Fort Morgan

St. Lucie sand, 0 to 5 percent slopes. The St. Lucie series consists of very deep, excessively drained, very rapidly permeable soils on dune-like ridges and on isolated knolls. They formed in marine or eolian sand.

St. Lucie-Leon-Muck complex. This complex consists of areas in which the St. Lucie, Leon, and Muck soils are intricately associated. St. Lucie and Leon soils tend to make up 80 percent of this complex, with Muck constituting the remaining 20 percent. This series is often poorly drained, and is found on stabilized sand ridges that have low, wet areas in between.

Coastal beaches. These soils are ridges formed from wind and water deposited sands of sedimentary origin. These beaches can be either excessively well drained or poorly drained and thus flooding varies.

Little Lagoon

Lakewood sand, 0 to 5 percent slopes. The Lakewood series consists of excessively well-drained soils, with small pockets of poorly drained soils, and have no frequency of flooding or ponding except in the minor, poorly drained components. These soils exist mostly on hill slopes and were formed from sandy marine deposits derived from sedimentary rock.

Leon sand. The Leon series consists of very deep, very poorly and poorly drained, moderately rapid to moderately slowly permeable soils on upland flats, depressions, stream terraces and tidal areas. They formed in sandy marine sediments.

St. Lucie-Leon-Muck complex. This complex consists of areas in which the St. Lucie, Leon, and Muck soils are intricately associated. St. Lucie and Leon soils tend to make up 80 percent of this complex, with Muck constituting the remaining 20 percent. This series is often poorly drained, and is found on stabilized sand ridge that have low, wet areas in between.

Gulf State Park

Tidal marshes. These soils are found in tidal flats and are composed primarily of herbaceous detritus and loamy marine material over sedimentary deposits. They are very poorly drained and are prone to frequent ponding and flooding.

Leon sand. The Leon series consists of very deep, very poorly and poorly drained, moderately rapid to moderately slowly permeable soils on upland flats, depressions, stream terraces and tidal areas. They formed in sandy marine sediments.

Coastal beaches. These soils are ridges formed from wind and water deposited sands of sedimentary origin. These beaches can be either excessively well drained or poorly drained and thus flooding varies.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed osprey nesting platforms would not be constructed in coastal Alabama and no impacts to geology and substrates would occur.

Proposed Action

Sections 6.3.8.1 and 6.7.1.1 of the Final Phase III ERP/PEIS describe the impacts to geology and substrates from early restoration projects to restore and protect birds. The Final Phase III ERP/PEIS found that short-term minor impacts could occur from ground disturbance from these restoration activities. For this project, impacts to geology and substrates were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

Osprey Restoration in Coastal Alabama would have a short-term minor impact on soils and no impact on geology as there would be no change in grade or other geological alterations. No major alterations to the landscape are necessary under the proposed action. Soil disturbance would be limited to a depth of 3 to 6 feet, with each bored hole less than 2 feet in diameter. This would result in a long term net soil loss of approximately 2.5 to 4.5 cubic feet at each site. In the short term, some compaction could occur during the construction phase (less than one day at each site), primarily from vehicular traffic accessing the platform sites. Platform installation would permanently remove soil during earth-moving activities. These activities are not expected to result in more than short-term minor impacts from erosion in the area of each platform due to the very small area of disturbance, and the nature of the soils around each project area. Adverse impacts would be short-term, localized and minor.

Potential mitigation measures for impacts to geology and substrates are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would be implemented under this action include:

- Employment of standard BMPs for construction to reduce erosion.
- Soil disturbance would be to the minimum area and minimum length of time necessary to complete the action.
- Use of existing access ways whenever possible. Temporary access roads would not be built in locations that would suggest a likelihood of excessive erosion (e.g., large slopes, erosive soils, proximity to water body). All temporary access roads would be restored when the action is completed, the soil would be stabilized, and the site would be re-vegetated.

9.2.5.1.1 Water Resources

Affected Environment

Inland Waters

Inland water features are found primarily within the Gulf State Park project area. Four lakes are prominent at the Little Lagoon and Gulf State Park sites. These lakes include:

- Gator Lake – approximately 40 acres located west of Little Lagoon; separated by Pine Beach Trail.
- Little Lake – approximately 40 acres located in the northeast portion of the park;
- Middle Lake – approximately 216 acres located in the central portion of the park, immediately south of the recreational vehicle (RV) parking area; and
- Lake Shelby – approximately 563 acres located in the western portion of the park.

Each lake is primarily brackish freshwater (USFWS 2010). A weir was constructed in 1991 in the drainage canal between Lake Shelby and Little Lagoon. The weir is designed to allow fresh water from Lake Shelby to drain into Little Lagoon. The weir also prevents brackish water from Little Lagoon flowing back into Lake Shelby. During extreme high tides brackish water still flows to Lake Shelby, and during storm surges, Gulf water can enter into both Lake Shelby and Middle Lake. Despite storm and tide events, the weir allows Lake Shelby to remain primarily as a freshwater ecosystem.

Wetlands

The five platforms would be located within the Mobile Bay and Perdido Bay watersheds. These watersheds contain numerous wetlands, or areas that are inundated by water at a frequency and duration sufficient to support vegetation adapted for life in saturated soil. Each platform could be sited in or near three primary types of wetlands: estuarine and marine wetland, freshwater emergent wetland, and freshwater forested/shrub wetland. Estuarine and marine wetlands contain mostly vegetated and non-vegetated brackish saltwater marsh, with characteristics varying based on tides and levels of salinity. Salt-tolerant plants, called halophytes, are often dominant. Freshwater emergent wetlands consist of herbaceous marsh, fen, swale, and meadow. Plants often found in these wetlands are cattails, sedges, and various grasses. Freshwater forested wetlands are vegetated communities of trees and shrubs such as bald cypress (*Taxodium distichum*) (Burns and Honkala 1990).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed osprey nesting platforms would not be constructed in coastal Alabama and no impacts to water resources would occur.

Proposed Action

Sections 6.3.8.2 and 6.7.2 of the Final Phase III ERP/PEIS describe the impacts to water resources from early restoration projects to restore and protect birds. The Final Phase III ERP/PEIS found that there could be short-term minor adverse impacts from the use of heavy equipment to remove existing vegetation that could leave soils vulnerable to erosion if replacement vegetative cover is not provided. Protecting nesting and foraging habitat for birds would have long-term benefits by preventing development and disturbances, which can reduce runoff and benefit water quality. For this project, impacts to water resources were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

Osprey Restoration in Coastal Alabama would have a short-term minor impact on water resources. Platforms could be constructed near inland waters and wetlands in some of the five proposed sites. However, no platforms are expected to be constructed in any freshwater lake found within the project area. Further, no construction would occur in tidal or brackish water bodies. If an osprey platform is sited in or near a wetland, construction-related impacts would likely be minimal since disturbance would be limited to bore holes. Any proposed activities in wetlands or other waters would be coordinated in advance with the USACE. When accessing the project sites, no construction equipment would be operated in a wetland, with access to the sites being provided in uplands. In summary, impacts during construction operation to inland waters and wetlands would be adverse but short-term, localized, and minor.

Potential mitigation measures for impacts to water quality are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would be implemented under this action include:

- Placement of structures would not occur in open water areas.
- Use of existing access ways whenever possible. Temporary access roads would not be built in locations that would suggest a likelihood of excessive erosion (e.g., large slopes, erosive soils, proximity to water body). All temporary access roads would be restored when the action is completed, the soil would be stabilized, and the site would be re-vegetated.
- Maintenance of generators, cranes, and any other stationary equipment operated within 150 feet of any natural or wetland area as necessary to prevent leaks and spills from entering the water.
- Employment of standard BMPs for construction to reduce erosion.
- Soil disturbance would be to the minimum area and minimum length of time necessary to complete the action.
- Selection and operation of heavy equipment to minimize adverse effects to the environment (e.g., minimally-sized, low-pressure tires, minimal hard turn paths for tracked vehicles, temporary mats or plates within wet areas or sensitive soils).
- Any construction in close proximity to and/or in tidal wetlands will be closely monitored by the ADCNR or its agent. Vehicles will be restricted to adjacent uplands and no vehicles will be allowed to enter any wetlands. All construction activities other than foot traffic, the auguring holes and the actual insertion of the platform into the augured hole will be restricted to

adjacent uplands. Any sediments remaining from hole excavation will be manually removed from wetlands and placed on adjacent uplands.

9.2.5.1.2 Noise

Affected Environment

Many mammals, insects, and birds decipher sounds to find desirable habitat and mates, avoid predators, protect their young, establish territories, and to meet other survival needs. Noise can interfere with these processes by changing an animal's behavior and affecting their hearing organs (National Research Council 2005). The source and degree of adverse effects would be dependent on the type, magnitude, and frequency of the noise, as well as the proximity of a given species to the source of the noise. The American National Standards Institute, World Health Organization, and EPA recommend a criterion of 55 dBA or greater—over a 24-hour period—as a level of significance when assessing noise impacts to humans (Berglund and Lindvall, Community Noise 1995). Noise levels above 55 dBA may cause annoyance and interference with outdoor activities.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed osprey nesting platforms would not be constructed in coastal Alabama and no impacts from noise disturbance would occur.

Proposed Action

Sections 6.3.8.4 and 6.7.4 of the Final Phase III ERP/PEIS describe the impacts from noise from early restoration projects to restore and protect birds. The Final Phase III ERP/PEIS found that during the construction period to create or enhance bird habitat, minor to major short-term adverse impacts to ambient noise levels may occur. The severity of impacts would depend to a large degree on the location of the project, type of equipment, the amount of noise that these activities would generate, and the distance to sensitive receptors such as recreational users or wildlife. Impacts on noise would be short-term during the construction period. For this project, impacts from noise were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

Potential sources of noise from siting osprey platforms include construction equipment and vehicular traffic. Equipment would likely consist of a pole placement truck, with auger and boom, and a second truck to transport the platforms and poles.

Noise from diesel engines and machinery would have the potential to impact wildlife and humans in the area. For example, an auger drill rig emits approximately 85 dBA when an individual stands at a distance of 50 feet from the machine (USDOT 2011). As mentioned in the affected environment, dBA levels above 55 may cause annoyance and interference for those outdoors. Individuals and wildlife within 1500 feet (i.e. approx. 1/4 mile) could potentially be disturbed, but the contribution to the soundscape would be

minor. Individuals beyond 1500 feet from the noise source are not expected to be impacted (see Table 9-1). Due to the nature of noise impacts and their limited duration, impacts during construction and operation would be adverse but short-term, localized, and minor.

Table 9-1. Decibel Levels by Distance from Auger Drill Rig

DISTANCE (ft)	dBA	dBA REDUCTION
50	85.0	0
100	79.0	6
300	69.4	15.6
600	63.4	21.6
1200	57.4	27.6
2400	51.4	33.6

Potential mitigation measures for impacts from noise are found in Appendix 6A of the Final Phase III ERP/PEIS. Any of these measures that would apply to Osprey Restoration in Coastal Alabama may be used to minimize adverse impacts.

9.2.5.1.3 Summary of Impacts to the Physical Environment

Impacts to the physical environment from implementation of Osprey Restoration in Coastal Alabama would include:

- Geology and Substrates: There would be short-term minor impact on soils and no impact on geology from the soil disturbance during platform installation. No long-term impacts would occur.
- Water Quality: There would be short-term minor impacts on water resources, including wetlands during construction from soil disturbance and erosion. No long-term impacts would occur.
- Noise: Due to the nature of noise impacts and their limited duration, impacts during construction and operation would be adverse but short-term, localized, and minor. No long-term impacts would occur.

9.2.5.2 Biological Environment

9.2.5.2.1 Living Coastal and Marine Resources

Affected Environment - General

Living coastal and marine resources include coastal and near-shore vegetative and aquatic communities of Mobile and Baldwin counties that occur in or near Mobile Bay and the Gulf of Mexico. The biological resources in this area consist of a diverse group of marine and benthic species and ecologically valuable habitats including reefs. The reefs are subtidal in nature, and form aggregates that are common in Mobile Bay (Gregalis, Powers and Heck, Jr. 2008).

Benthic invertebrate communities include infauna (aquatic animals that live in the substrate of the sea bottom) and epifauna (animals that live on the surface of the sea floor). Nearshore benthic communities in the Gulf are largely composed of macroinvertebrate groups such as mollusks, sponges, polychaetes, corals, and crustaceans. These groups are diverse and are found in Gulf habitats spanning from the intertidal zone to the soft sediments on the continental shelf. Benthic communities perform important ecological functions in the nearshore food web; several groups (e.g., oysters, shrimp, and crabs) are also commercially important. Sponges, mollusks, arthropods (including crustaceans) and polychaetes are all important taxa and contribute substantially to benthic biomass. These taxa include many species, such as oysters, that are filter feeders. Filter feeders remove and digest phytoplankton and particulate organic matter, and deposit processed materials to the substrate (Felder and Camp 2009).

Environmental Consequences - General

Living coastal and marine resources with the potential to be affected by the proposed action include: benthos, invertebrates and fish, wildlife and habitats, and threatened and endangered species. The affected environment and impacts under the proposed action for each of these resources is discussed individually below. Overall impacts to living coastal and marine resources are summarized here for the No Action and Proposed Action.

No Action

Under the No Action Alternative, the proposed osprey nesting platforms would not be constructed in coastal Alabama and no impacts to living coastal and marine resources would occur. Long-term benefits from the construction of the platforms and the habitats they provide would not be realized.

Proposed Action

Sections 6.3.8.5, 6.3.8.6, and 6.7.6 of the Final Phase III ERP/PEIS describe the impacts to living coastal and marine resources from early restoration projects to restore and protect birds. The Final Phase III ERP/PEIS found that there would be short-term minor adverse impacts from increased soil erosion, vegetation trampling, vegetation removal, or other human activity from project staging or construction, or implementation of restoration activities on adjacent uplands, coastal transition zones, barrier flats, dunes and beaches. There would also be long-term beneficial impacts from protecting bird habitat from disturbance or development. For this project, impacts to living coastal and marine resources were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

Osprey Restoration in Coastal Alabama would have a short-term minor impact on the living coastal and marine resources evaluated in detail (wildlife and wildlife habitat and threatened and endangered species). The majority of living coastal and marine resources are not expected to be affected by the proposed action because the platforms would not be placed in open water. Some invertebrates may be impacted by the placement of the platforms and disturbed during the establishment of the holes for the platforms. This disturbance would be limited to a depth of 3 to 6 feet, with each bored hole less than 2 feet in diameter. This would result in a long term net soil loss of approximately 2.5 to 4.5 cubic feet at

each site. Disturbance around the bored hole would occur for only the less than one day construction period at each site. The bore hole would be filled with the platforms, and would no longer be available for benthic invertebrate habitat. Indirect impacts to living coastal and marine resources could include impacts to from changes in water quality. Vehicular chemicals such as oil and gasoline have potential to leach into the soil during platform transport and construction. However, due to the limited amount of construction vehicles and very short construction duration at each site (less than one day) these potential impacts are expected to occur. Therefore, impacts during construction would be adverse but short-term, localized, and minor. No long-term impacts are expected.

Potential mitigation measures for impacts to each of the living and coastal marine resource categories discussed below are in Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would be implemented as part of this action include:

- Employment of standard BMPs for construction to reduce erosion.
- Soil disturbance would be kept to the minimum area and minimum length of time necessary to complete the action.
- Use of existing access ways whenever possible. Temporary access roads would not be built in locations that would suggest a likelihood of excessive erosion (e.g., large slopes, erosive soils, proximity to water body). All temporary access roads would be restored when the action is completed, the soil would be stabilized, and the site would be re-vegetated.
- Qualified ADCNR staff would be on site, as needed, where sensitive species are likely to be encountered and would be onsite and would monitor for the presence of sensitive species.
- Provide individuals working on site general awareness to the sensitive species that could be encountered.
- Any construction in close proximity to and/or in tidal wetlands will be closely monitored by the ADCNR or its agent. Vehicles will be restricted to adjacent uplands and no vehicles will be allowed to enter any wetlands. All construction activities other than foot traffic, the auguring holes and the actual insertion of the platform into the augured hole will be restricted to adjacent uplands. Any sediments remaining from hole excavation will be manually removed from wetlands and placed on adjacent uplands.

9.2.5.2.2 Wildlife and Habitats

Affected Environment

Wildlife includes all native and naturalized vertebrate and invertebrate species of animals. This section focuses on common and typical species that have the potential to occur or are known to occur near the proposed project area, as well as those of general interest and importance to the ecosystem. Bird species protected under the MBTA are found in coastal Alabama, and are also given special consideration under Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds.

Coastal Alabama provides habitat that supports a variety of wildlife species, including mammals, reptiles, amphibians, birds, fish, and invertebrates. Mammals that would likely be present include

species such as Virginia opossum (*Didelphis virginiana*), white-tailed deer (*Odocoileus virginianus*), squirrels (*Sciurus niger; Sciurus carolinensis*), beaver (*Castor Canadensis*), and bobcat (*Lynx rufus*) (Mirarchi 2004). Commonly observed reptiles and amphibians include various types of turtles, skinks, snakes, and frogs (Mirarchi 2004). Birds include passerines (songbirds), hawks, and shorebirds (ADCNR 2015). Several species of fish such as minnows and sunfish likely inhabit the inland aquatic areas. Invertebrates would include worms, snails, insects, and crustaceans.

Migratory birds include neo-tropical (long-distance) migrants, temperate (short-distance) migrants, and resident species. Neo-tropical migratory birds are Western Hemisphere species in which the majority of individuals breed in areas north of the Tropic of Cancer in the spring/early summer and spend the winter in areas south of the Tropic of Cancer. Approximately 200 species of neo-tropical migratory birds are known in the Western Hemisphere. The majority are passerines (songbirds) such as the red-eyed vireo (*Vireo olivaceus*), hooded warbler (*Setophaga citrine*), American redstart (*Setophaga ruticilla*), and common yellowthroat (*Geothlypis trichas*) (USFWS 2004).

The MBTA of 1918 is the primary legislation in the United States protecting migratory birds. The MBTA prohibits taking, killing, or possessing migratory birds unless permitted by regulation. Species protected by the MBTA appear in Title 50, Section 10.13 of the Code of Federal Regulations (50 C.F.R. § 10.13). Most bird species found GSP are covered under the MBTA; species such as European starlings and house sparrows (both invasive species) are not covered.

Neo-tropical migratory birds in particular, such as the warblers, use scrub dune habitats and pine woodlands as stopover habitats during spring and fall migrations across the Gulf of Mexico. Up to 48 species may occur in the project area, mostly in undeveloped tracts, though the relative abundance of these migrants at individual sites can vary from year to year (USFWS 2004).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed osprey nesting platforms would not be constructed in coastal Alabama and no impacts to wildlife and wildlife habitat would occur. Long-term benefits from the construction of the platforms and the habitats they provide would not be realized.

Proposed Action

Osprey Restoration in Coastal Alabama would have a short-term minor impact on wildlife and wildlife habitats. Mammals, amphibians, reptiles, birds or fish residing near the proposed construction areas may be displaced because of noise from construction activities; however, these species would likely temporarily relocate to other areas for the less than one day construction period at each site. The auger, boom, and vehicles used for construction would be at each platform site for less than one day, thereby reducing the potential for impacts to terrestrial species. Any construction occurring near aquatic habitat would be conducted using BMPs to reduce erosion and sedimentation, both of which can have a negative impact on aquatic species. However, no platforms are expected to be constructed in any freshwater lake found within the project area. No trees or shrubs would be removed to access the sites

or to complete construction. Should any removal be required, qualified ADCNR staff would be on site to conduct surveys of trees or shrubs for nesting activity before they are removed. Therefore, impacts to wildlife during construction would be adverse but short-term, localized, and minor. No long-term impacts are expected as there would be no maintenance activities that would cause disturbance to wildlife and wildlife habitats. Once in operation, the placement of the platforms would not result in habitat fragmentation and would not result in adverse impacts. In addition, the platforms would provide additional nesting habitat for osprey and opportunistically for other species such as bald eagle, resulting in long-term beneficial impacts to that species.

The potential introduction of terrestrial and aquatic non-native invasive species of plants, animals, and microbes is a concern for any proposed project. Non-native invasive species could alter existing terrestrial or aquatic ecosystems, may cause economic damages and losses, and are the second most common reason for protecting species under the Endangered Species Act. The species that are or may become introduced, established, and invasive are difficult to identify. The analysis focuses on pathway control or actions/mechanisms that may be taken or implemented to prevent the spread of invasive species on site or introduction of species to the site. Surveys have not been conducted to determine if invasive species are present.

This project involves the installation of nesting platforms. Each of these actions and pieces of equipment serve as a potential pathway to introduce or spread invasive species. BMPs would be implemented to ensure these pathways are "broken" and do not spread or introduce species (see BMPs listed below). The implementation of these BMPs meets the spirit and intent of EO 13112. Due to the implementation of BMPs, the Trustees expect risk from invasive species introduction and spread to be short-term and minor.

The Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review would result in the avoidance and minimization of the introduction and spread of invasive species:

- All equipment to be used during the project, including personal gear, would be inspected and cleaned such that there is no observable presence of mud, seeds, vegetation, insects and other species.
- Material used to construct the platforms would be treated or inspected to remove "non-target" species.

9.2.5.2.3 Threatened and Endangered Species

Affected Environment

The Endangered Species Act was passed in 1973 to protect threatened or endangered species from further harm. The U.S. Fish and Wildlife Service and the National Marine Fisheries Services enforce the ESA. Under the ESA, FWS and NMFS identify the listed species and habitats, and work through consultations and permit actions to protect those species and their critical habitat.

While the areas surrounding the proposed project sites harbor a number of federally-listed threatened, endangered, proposed or candidate species, not all of these species occur in the potential project areas. For the species that do occur in or near the proposed project areas, their occurrence is considered to be transient in nature. For these reasons, this section focuses on the species that are most likely to occur in or around the proposed project areas, including the Alabama beach mouse (*Peromyscus polionotus ammobates*), sea turtles, piping plover (*Charadrius melodus*), red knot (*Calidris canatus*), wood stork (*Mycteria americana*), gopher tortoise (*Gopherus polyphemus*), and the black pine snake (*Pituophis melanoleucus lodingi*). A complete list of threatened and endangered species potentially occurring in one of more of the proposed project areas is provided in Table 9-2.

Alabama Beach Mouse

The Alabama beach mouse is a federally listed endangered species known to occupy sparsely vegetated areas on the Fort Morgan Peninsula and suitable habitat of Gulf State Park. This small gray and white mouse with a dark stripe running down the upper surface of its tail is a nocturnal rodent inhabiting burrows in frontal, secondary, and scrub dunes along the Alabama Gulf coast.

In frontal dune areas, Alabama beach mice feed on seeds of sea oats, beach grass, evening primrose (*Oenothera* spp.), ground cherry (*Physalis* sp.), saltmeadow cordgrass (*Spartina patens*), bluestem (*Schizachrium maritimum*), and panic grass (*Panicum amarum*). Plant species foraged by Alabama beach mice in scrub areas include sand live oak (*Quercus geminate*), bluestem, greenbrier (*Smilax rotundifolia*), gopher apple (*Licania michauxii*), and jointweed (*Polygonella* spp.) (USFWS 2004).

The Alabama beach mouse was listed as an endangered species by the USFWS in 1985. The mice historically occurred in frontal, secondary, and scrub dunes from Fort Morgan eastward about 32 miles to Ono Island in Perdido Bay. At its time of listing in 1985, the Alabama beach mouse was considered extirpated on Ono Island, but present elsewhere throughout its original range. After several hurricanes that reduced beach mouse populations, the USFWS reintroduced Alabama beach mouse to Gulf State Park in 2010, and since that time their population numbers have increased considerably (USFWS 2013).

Numerous surveys have documented the presence and relative abundance of Alabama beach mice on the Fort Morgan Peninsula (USFWS 2004). Relative abundance of the species as surveyed throughout its geographic range, using live trap/capture and release methods, has varied from 1.69 to 61.0 mice per 100 trap-nights. However, relative abundance has typically ranged from 3 to 10 mice per 100 trap-nights.

Alabama beach mice populations fluctuate within and among sites on a monthly, seasonal, and annual basis. These spatial and temporal differences have been attributed to habitat type, food availability, recruitment following peak reproductive periods, temperature, predation, and storms. Scrub dunes occupied by the mice can function as crucial refuge during severe hurricanes that overwash, flood, and destroy most of the lower frontal and secondary dunes.

Relative abundance of Alabama beach mice in certain types of scrub dunes can be comparable to that within primary and secondary dunes (USFWS 2004). In coastal environments, the term “scrub dune”

refers to habitat or vegetation types where scrub oaks dominate a community adjacent to and landward of secondary/ primary dunes. There is substantial variation in scrub oak density and coverage within and among scrub dunes throughout the geographic range of Alabama beach mice. Such variation, resembling an ecological gradient, is represented by scrub oak woodland with a relatively closed canopy at one end of the continuum and relatively open scrub dunes with patchy scrub ridges and intervening swales or inter-dunal flats dominated by herbaceous plants at the other end of the gradient. The relative abundance of Alabama beach mice in this open, patchy scrub environment is comparable to that in primary and secondary dunes.

Alabama beach mouse critical habitat is also present within the proposed site locations.

The FWS identified the following PCEs in the revised critical habitat for the Alabama beach mouse:

1. Continuous mosaic of primary, secondary and scrub (i.e., interconnected frontal and tertiary dunes, and interior scrub) vegetation and dune structure, with a balanced level of competition and few or no competitive or predaceous nonnative species present, that collectively provide foraging opportunities, cover and burrow sites;

2. Frontal dunes, generally dominated by sea oats, that, despite occasional temporary impacts and reconfiguration from tropical storms and hurricanes, provide abundant food resources, burrow sites, and protection from predators;

3. Scrub (i.e., tertiary dune/suitable interior scrub) dunes, generally dominated by scrub oaks (*Quercus spp*.), that provide food resources and burrow sites, and provide elevated refugia during and after intense flooding due to rainfall and/or hurricane-induced storm surge;

4. Unobstructed habitat connections that facilitate genetic exchange, dispersal, natural exploratory movements, and recolonization of locally extirpated areas;

5. Natural light regime within the coastal dune ecosystem, compatible with the nocturnal activity of beach mice, necessary for normal behavior, growth and viability of all life stages.

Sea Turtles

Sea turtles that occur in the United States are federally listed as either threatened or endangered. Critical habitat has been designated for Loggerhead sea turtles (see below). In general, sea turtles can be found in the nearshore waters and in some of the estuaries in Alabama. While four species (loggerhead, green, Kemp's ridley, and leatherback) of sea turtles have been documented in Alabama waters, only loggerhead, green, and Kemp's Ridley sea turtles have been documented to nest on Alabama's Gulf side beaches.

Green Sea Turtles: The green turtle (*Chelonia mydas*) is circumglobal in tropical and sub-tropical waters. In the continental United States, green turtles occur from Texas to Massachusetts. The Florida breeding population is federally listed as endangered, and elsewhere the species is listed as threatened. Primary nesting beaches in the southeastern United States occur in a six-county area of east-central and

southeast Florida where nesting activity ranges from approximately 350 to 2,300 nests annually (USFWS 2004). Green sea turtles have been observed on Alabama's coastal beaches, but only one nest has been recorded between 2003 and 2012 (Ingram 2013).

<u>*Loggerhead Sea Turtles*</u>: The loggerhead turtle (*Caretta caretta*) is listed as a threatened species throughout its range. This species is circumglobal, preferring temperate and tropical waters. In the southeastern United States, 50,000 to 70,000 nests are deposited annually, about 90 percent of which occur in Florida. Most nesting in the Gulf outside of Florida appears to be along the Alabama Gulf coast. Although loggerhead sea turtles are observed offshore the Chandeleur Islands of Louisiana, there has been little documentation of nesting. The loggerhead turtle (northwest Atlantic distinct population segment) is by far the most common sea turtle found along beaches in coastal Alabama (USFWS 2004). Loggerhead sea turtles have been observed on Alabama's coastal beaches, with an average of five nests a year between 2008 and 2012 (USFWS 2013).

The USFWS designated critical habitat for the Northwest Atlantic Ocean Distinct Population Segment of the loggerhead sea turtle. Critical habitat was designated for the loggerhead on July 10, 2014 for both the marine and terrestrial environments (79 FR 39756; 79 FR 51264). In total, 739.3 miles of loggerhead sea turtle nesting beaches are proposed for designation as critical habitat in North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi. Many of Alabama's coastal beaches are within the Northern Gulf of Mexico Recovery Unit, which consists of 135.5 miles of shoreline in the Florida panhandle, Alabama, and Mississippi. The proposed terrestrial critical habitat includes the areas that are extra-tidal or dry sandy beaches from the mean high water line to the toe of the secondary dune, that are capable of supporting a high density of nests or serving as an expansion area for beaches with a high density of nests, and that are well distributed with each State or region within a State and representative of total nesting to be a physical or biological feature for the species. Additionally, the natural coastal processes or activities that mimic these processes (particularly the dynamic process of erosion and accretion) are also identified as a physical or biological feature for this species. The Primary Constituent Elements are the specific elements of the physical or biological features that provide for a species' life history processes and are essential to the conservation of the species. PCEs for loggerhead critical habitat include (USFWS 2014):

- PCE 1 - *Suitable nesting beach habitat that*:
    - has relatively unimpeded nearshore access from the ocean to the beach for nesting females and from the beach to the ocean for both post-nesting females and hatchlings, and
    - is located above mean high water to avoid being inundated frequently by high tides.
- PCE 2 - *Sand that*:
    - allows for suitable nest construction,
    - is suitable for facilitating gas diffusion conducive to embryo development, and
    - is able to develop and maintain temperatures and moisture content conducive to embryo development.

- PCE 3 - Suitable nesting beach habitat with sufficient darkness to ensure that nesting turtles are not deterred from emerging onto the beach and hatchlings and post-nesting females orient to the sea.
- PCE 4 - *Natural coastal processes or artificially created or maintained habitat mimicking natural conditions.* This includes artificial habitat types that mimic the natural conditions described in PCEs 1 to 3 above for beach access, nest site selection, nest construction, egg deposition and incubation, and hatchling emergence and movement to the sea. Habitat modification and loss occurs with beach stabilization activities that prevent the natural transfer and erosion and accretion of sediments along the ocean shoreline. Beach stabilization efforts that may impact loggerhead nesting include beach nourishment, beach maintenance, sediment dredging and disposal, inlet channelization, and construction of jetties and other hard structures. However, when sand placement activities result in beach habitat that mimics the natural beach habitat conditions, impacts to sea turtle nesting habitat are minimized.

<u>*Kemp's Ridley Sea Turtles*</u>: The Kemp's ridley sea turtle (*Lepidochelys kempii*) is listed as an endangered species throughout its range. Adults are found mainly in the Gulf of Mexico. Immature turtles can be found along the Atlantic coast as far north as Massachusetts and Canada. The species' historic range is tropical and temperate seas in the Atlantic Basin and in the Gulf of Mexico. Nesting occurs primarily in Tamaulipas, Mexico, where virtually the entire population of these turtles nests along about 10 miles of beach. Recent observations at this nesting beach indicate that there was a substantial increase in the number of nesting females using that site during the 2000 nesting season compared to nesting records from 1999. The species occasionally nests in Texas and other southern states, including an occasional nest in North Carolina and Alabama. Kemp's ridley sea turtles have been observed on Alabama's coastal beaches. From 2006 to 2010 there were seven confirmed Kemp's Ridley nests along the Alabama coast (Reetz 2013).

<u>*Leatherback Sea Turtles*</u>: Leatherback sea turtles (*Dermochelys coriacea*) are the largest sea turtles. They are listed as endangered throughout the range. Unlike other sea turtles, leatherbacks are more dependent on prey and reproductive requirements than temperature when it comes to their distribution. Leatherbacks are able to regulate their internal temperature more than the other turtles discussed here; therefore, leatherbacks range from the tropics into cool temperate waters. (USFWS 2008).

Piping plover

Piping plover (*Charadrius melodus*) in Alabama are found on coastal beaches that present optimal foraging conditions, with birds possibly present from August to May and peak numbers in winter. Most of these sites are in Mobile County. Little Dauphin Island, Pelican Island, and parts of Dauphin Island are traditional wintering sites. Occasionally plovers are seen in Baldwin County on the western tip of Fort Morgan Peninsula around washover pools along the shoreline. In 2001, wintering critical habitat was designated in Alabama that encompassed the tidal zones, flats, and associated dune systems of Dauphin Island, Little Dauphin Island, Pelican Island, Isle Aux Herbes, and the western tip of the Fort Morgan Peninsula (USFWS 2001).

The PCEs for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support these habitat components. The PCEs are found in geologically dynamic coastal areas that support intertidal beaches and flats (between annual low tide and annual high tide) and associated dune systems and flats above annual high tide. Additional information on each specific unit included in the designation can be found at 66 FR 36038. PCEs of wintering piping plover critical habitat include:

1) Intertidal flats with sand or mud flats (or both) with no or sparse emergent vegetation.

2) Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers. Such sites may have debris, detritus, or microtopographic relief (less than 50 cm above substrate surface) offering refuge from high winds and cold weather.

3) Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas.

4) Washover areas are broad, unvegetated zones, with little or no topographic relief, that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action.

Activities that affect PCEs include those that directly or indirectly alter, modify, or destroy the processes that are associated with the formation and movement of barrier islands, inlets, and other coastal landforms. Those processes include erosion, accretion, succession, and sea-level change. The integrity of the habitat components also depends upon daily tidal events and regular sediment transport processes, as well as episodic, high-magnitude storm events (Service 2001b).

Between 1981 and 2014, piping plover sightings in Mobile and Baldwin counties indicate that there is an average high count of approximately 8 individuals occurring in March and an average low count of less than 1 individual occurring in June (eBird 2015).

Red Knot

The red knot (*Calidris canutus rufa*), was listed as a threatened species in December 2014. This medium-sized bird species is a migratory species that uses coastal beaches and marine intertidal areas as stopover feeding locations or staging areas on the way to and from their wintering grounds in South America and breeding areas in the Arctic. Foraging on ocean beaches, mud and sand flats, and salt marshes occurs from March to April during the northward spring migration and September to October during the southward autumn migration (USFWS 2013). Roosting and resting habitat includes areas above the high tide line such as reefs and high sand flats (USFWS 2013). Between 1981 and 2014, red knot sightings in Mobile and Baldwin counties indicate that there is an average high count of approximately 12 individuals occurring in December and an average low count of less than 1 individual in February (eBird 2015).

Wood stork

The wood stork (*Mycteria americana*) is a threatened species originally listed by USFWS in 1984. This large wading bird is typically associated with freshwater habitats and prefers swamps, coastal shallows, ponds, and flooded pastures (Stokes 1996). The wood stork nests in colonies often in cypress stands or mangroves. This species does not have a breeding population within the state of Alabama, but non-breeding transient individuals may be present on occasion (USFWS 2007). No known wood stork foraging or roosting sites are located in the direct vicinity of any proposed platform locations.

Gopher Tortoise

The gopher tortoise (*Gopherus polyphemus*) is a large (shell is 5.9 to 14.6 inches long), dark-brown to grayish-black terrestrial turtle with elephantine hind feet, shovel-like forefeet, and a gular projection beneath the head on the yellowish, hingeless plastron or undershell (Ernst and Barbour 1972). The species is listed as threatened wherever found west of Mobile and Tombigbee Rivers in Alabama, Mississippi, and Louisiana. The gopher tortoise is a candidate species in Baldwin County, Alabama. Gopher tortoises occur north of Highway 182 within Gulf State Park near existing trails in the park.

Black Pine Snake

The black pine snake (Pituophis melanoleucus lodingi) is a large (48 to 64 inches long) stocky snake and is only proposed for threatened status by the US Fish and Wildlife Service. Its back and belly are uniformly black or dark brown. Faint blotches may be seen on the hindbody or tail (USFWS 2015). The snake has a range that extends from southwestern Alabama, through southern Mississippi, and into southeastern Louisiana. In each of these states it is considered imperiled or critically imperiled, and the U.S. Fish and Wildlife Service proposed the snake for federal listing under the Endangered Species Act on October 10, 2014. The snake is known to occur in Mobile County, largely in upland, open longleaf pine forests with dense herbaceous groundcover (USFWS 2015). The distribution of remaining populations has become highly restricted due to the destruction and fragmentation of the longleaf pine habitat, which has become one the most critically endangered ecosystems in the United States (USFWS 2013). In Alabama, populations occurring on properties managed as gopher tortoise habitat are likely the best opportunities for long-term survival of the black pine snake (USFWS 2013).

Eastern Indigo Snake

The eastern indigo snake (*Drymarchon corais couperi*) is a large (60 to 74 inches) snake with a black and iridescent blue body (USFWS 2015). The chin and throat are reddish or white, and the color may extend down the body (USFWS 2015). The belly is cloudy orange and blue-gray (USFWS 2015). Historically, the eastern indigo snake lived throughout Florida, the coastal plain of southern Georgia, extreme south Alabama, and extreme southeast Mississippi (USFWS 2015). Today the indigo snake survives in Florida and southeast Georgia, and has been extirpated from Alabama and Mississippi (USFWS 2015); therefore, it is extremely unlikely to exist in the project area. The Indigo Snake is often dependent upon the deep burrows dug by the gopher tortoise and uses them as a refuge from extreme temperatures (ADCNR 2015). This restricted habitat is even more isolated by the snake's preference for the interspersion of

wet lowlands like cypress ponds (ADCNR 2015). These preferred areas are usually found where rivers and creeks run thru sand hills habitat (ADCNR 2015).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed osprey nesting platforms would not be constructed in coastal Alabama and no impacts to threatened and endangered species would occur. Long-term benefits from the construction of the platforms and the habitats they provide would not be realized.

Proposed Action

Osprey Restoration in Coastal Alabama would have a short-term minor impact on threatened and endangered species. However, the proposed action is expected to have no effect on all listed species potentially occurring within the project area, with the exception of the Alabama beach mouse which could, but is not likely to be adversely impacted. Table 9-2 shows the species that have the potential to be affected by the proposed project. The proposed project consists of the installation of five poles, with a total footprint of less than 10 square feet across two Alabama counties.

Coordination and informal consultation under the Endangered Species Act, Migratory Bird Treaty Act, and Bald and Golden Eagle Protection Act has been completed. Because no project activities will take place in Alabama beach mouse critical habitat and becauset conservation measures will be properly implemented, the Trustees have determined the proposed project may affect, but will not likely adversely affect the Alabama beach mouse. Accordingly, the Trustees have made a "Not Likely to Adversely Affect" determination under the ESA for the Alabama beach mouse. For all other threatened, endangered, and candidate species in the area (see Table 9-2), the Trustees made No Effect determinations. In June 2015, the Trustees requested concurrence from the USFWS regarding these determinations (DOI 2015). The U.S. Fish and Wildlife Service provided concurrence with this determination on July 10, 2015 (USFWS 2015). The National Oceanic and Atmospheric Administration provided a determination on August 14, 2015 that determined that the Osprey Restoration in Coastal Alabama Project falls outside of the National Marine Fisheries Service (NMFS) ESA jurisdiction (occur above the mean high water line), as it does not contain suitable habitat for species managed by NMFS. This project does not require further ESA evaluation from NOAA (NOAA 2015).

Table 9-2. Threatened and Endangered Species Potentially Affected by the Proposed Project

Common Name	Scientific Name	Federal Status	Trustees' Affect Determination
Alabama beach mouse	*Peromyscus polionotus ammobates*	Endangered	Not Likely to Adversely Affect
Loggerhead sea turtle	*Caretta caretta*	Threatened	No Effect
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	No Effect
Green sea turtle	*Chelonia mydas (P)*	Threatened	No Effect
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	No Effect

Common Name	Scientific Name	Federal Status	Trustees' Affect Determination
Gopher tortoise	*Gopherus polyphemus*	Threatened (Mobile County)/Candidate Species (Baldwin County)	No Effect
Black pine snake	*Pituophis melanoleucus lodingi*	Proposed Threatened	No Effect
Eastern indigo snake	*Drymarchon corais couperi*	Threatened	No Effect
Piping plover	*Charadrius melodus*	Threatened	No Effect
Red knot	*Calidris canutus rufa*	Threatened	No Effect
Wood stork	*Mycteria americana*	Threatened	No Effect

Impacts to protected species would largely be avoided as locations where the platforms would actually be installed would be selected to be outside of endangered, threatened, proposed, or candidate species habitat and would not be placed in critical habitat. Transient individuals using the area could be impacted by construction noise and potentially slight changes in water quality, though best management practices would be used to minimize noise and turbidity as much as practicable. If protected species would enter the project area, all project activities (including driving to/from the project site) would halt until the species move of their own volition. Potential impacts are expected to be short-term (less than one day per site for construction), localized and minor, and would not measurably alter natural conditions. For these reasons the Trustees have determined the proposed project, if implemented, may affect but is not likely to adversely affect protected species and no critical habitat will be adversely modified or destroyed.

Implementation of the following BMPs would effectively reduce or eliminate the potential for impacts to threatened or endangered species and provide rationale for the affect determinations presented in Table 9-2:

- The construction period at each site is less than one day and is expected to last approximately two hours, during which time ACDNR staff would be on site to monitor for ESA listed species.
- No platforms would be placed in open water.
- No platforms would be placed in any designated critical habitat.
- Platforms would not be placed on Gulf-fronting beaches and dunes, effectively avoiding impacts to piping plover, red knot, and the five listed sea turtle species potentially occurring in or near the project area.
- No platforms would be placed in locations in Mobile County known to have gopher tortoises. In Baldwin County, platforms would be placed below elevations where gopher tortoises are expected to occur, where elevation is defined as ground height above mean sea level. Platforms would be placed adjacent to tidal waterbodies, which are generally below the elevation where gopher tortoises are known to dig their burrows. This is because the water table is 1-2 feet below ground surface elevation and gopher tortoises do not utilize flooded burrows. In the

event that a platform is placed at a higher elevation, the vehicle access route and the area within a 100 foot radius of the platform location would be thoroughly visually inspected to ensure that there are no tortoise burrows present prior to and during construction.

- Platforms would not be placed in upland pine forest where black pine snakes are expected to occur.
- If a platform is placed in wetlands, no vehicles or construction equipment would be placed or operated in wetlands during any portion of project implementation. The platform would be placed within reach of the vehicle boom and any soil augured out of the placement hole would be removed from wetlands once the pole is set.
- No project activities would take place in ABM critical habitat. In general, the location of the proposed platform on Fort Morgan would be sited to avoid dune habitats used by the beach mouse, specifically avoiding designating critical habitat. Because beach mouse can occur in a wide variety of sandy dune habitats (primary, secondary, and scrub dunes) and because the Ft Morgan peninsula consists mostly of these habitat types, the ABM could be present. However, to minimize impacts to ABM, the site selected would not be on primary or secondary dunes and will be accessible via existing access roads. Prior to installing the platform, the area would be searched for evidence of beach mouse use and areas of use would be avoided to minimize noise and overall disturbance for the duration of the pole installation. It is extremely unlikely that the placement of one platform pole would hit a burrow.

9.2.5.3 Human Uses

9.2.5.3.1 Cultural Resources

Affected Environment

For the purposes of compliance with Section 106 of the National Historic Preservation Act of 1966, as amended and its implementing regulations, the Area of Potential Effect (APE) is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist (36 C.F.R. § 800.16 (d)). The APE of the proposed project consists of the area where each platform would be placed, as well as the access road to each site. General project areas shown in figures 9-1 to 9-5 were considered for potential cultural resources.

Three historic sites listed on the National Register of Historic Places (NRHP) exist within the general areas proposed for placement of osprey towers. Fort Morgan is located at the western tip of the Fort Morgan Peninsula in Baldwin County, Alabama. Fort Gaines and Indian Mound Park (also known as Shell Mound Park) are located on the eastern end of Dauphin Island in Mobile County, Alabama. Fort Morgan and Fort Gaines were constructed in 1834 and 1821, respectively, and were intended to guard the entrance to Mobile Bay against ships attempting to enter from the Gulf of Mexico. Both forts are best known for their utilization during the American Civil War. Fort Morgan was added to the NRHP in 1966 and Fort Gaines was listed in 1976. Indian Mound Park is the site of prehistoric Native American shell middens near the northern shore of Dauphin Island. It was officially listed in the NRHP in 1973.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed osprey nesting platforms would not be constructed in coastal Alabama and no impacts to cultural resources would occur.

Proposed Action

Chapter 6, Section 6.6.2, Tables 6-3, 6-4 and Tables 6A-1, 6A-2, found in Chapter 6, Appendix A of the Final Phase III ERP/PEIS describe potential impacts and mitigation measures for cultural resources. Those that could apply to Osprey Restoration in Coastal Alabama include conducting preconstruction surveys for the presence of sensitive natural and cultural resources.

The project area has not been surveyed for cultural resources. A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse effects on historic properties located within the project area. Measures to avoid impacts would include not siting platforms in areas with sensitive cultural resources. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

9.2.5.3.2 Aesthetics and Visual Resources

Affected Environment

Aesthetics and visual resources that may be affected by the proposed project include areas that fall within the viewshed of the proposed platforms and construction activities. This includes the land around Mobile Bay and its associated residential communities. The platform locations would be located along the coast and within view of water.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed osprey nesting platforms would not be constructed in coastal Alabama and no impacts to aesthetics and visual resources would occur.

Proposed Action

Sections 6.4.8 and 6.7.10.1 of the Final Phase III ERP/PEIS describe the impacts to aesthetics and visual resources from early restoration projects to enhance nesting habitat. The Final Phase III ERP/PEIS found that project types involving the use of construction equipment, including equipment used for the movement and placement of materials would result in some minor to moderate short-term adverse impacts on aesthetics and visual quality. During the construction period, visible impedances would detract from the natural landscape and create visual contrast for observers visiting the project areas. The severity of impacts would depend to a large degree on the location of the proposed projects, the

degree to which these activities would be visible, the duration of the construction activities and how commonplace these activities and equipment are in certain areas. Impacts would likely be greatest in areas frequented by large groups of visitors and in areas where more natural viewsheds exist. Projects resulting in the long-term placement of structures and signage could result in long-term minor adverse impacts to aesthetics, though these types of objects are often commonplace and would become less intrusive over time. For this project, impacts to aesthetics and visual resources were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

The transport and storage of platform materials associated with the proposed action would minimally impact visual resources. The platform installation process, which would likely include pouring a concrete footing into an excavation location, would be localized and short-term and result in minor adverse impacts. Once installed, there would be a change in the viewshed as a result of these platforms, but this would not dramatically alter aesthetics in a way that would detract from other activities in the area. Typical design for such structures is 3 feet by 3 feet nesting platform atop a pole approximately 10 to 20 feet high. Poles are typically placed 3 to 6 feet deep in the ground. Sheet metal would be attached to the pole approximately 3 to 6 feet above the ground to protect eggs and fledglings from predators. While changing the viewshed, these platforms would not be out of context with their surroundings and would not detract from use of the area. Therefore, impacts during construction (short-term) and operation (long-term) would be adverse but localized, and minor.

9.2.5.3.3 Summary of Impacts to Human Uses

Impacts to human uses from implementation of Osprey Restoration in Coastal Alabama would include:

- Cultural Resources: A complete review of this project under Section 106 is ongoing. That review would be completed prior to undertaking any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse effects on historic properties located within the project area.
- Aesthetics and Visual Resources: The proposed action would result in minor, short term visual impacts while construction equipment is used at the project site. The placement of the osprey platforms would result in a direct, long term, minor adverse impact on the aesthetics and visual resources of the area and these platforms would become less intrusive over time.

9.2.6 Cumulative Impacts

As discussed in Chapter 4, the CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined as “the impact on the 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” (40 C.F.R. § 1508.7).

The Osprey Restoration in Coastal Alabama cumulative impacts analysis tiers from the Final Phase III ERP/PEIS analysis of Alternative 4 (Contribute to Restoring Habitats, Living Coastal and Marine

Resources, and Recreational Opportunities), which evaluated the type of restoration activity proposed for Osprey Restoration in Coastal Alabama . The Final Phase III ERP/PEIS analysis of cumulative impacts relevant to the proposed Osprey Restoration in Coastal Alabama is incorporated by reference into the following cumulative impacts analysis. The following analysis focuses on the potential additive effects of the proposed Osprey Restoration in Coastal Alabama to the effects of past actions evaluated in the Final Phase III ERP/PEIS cumulative impacts analysis and the effects of some past, present, and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS.

9.2.6.1 Site Specific Review and Analysis of Cumulative Impacts to Relevant Resources

This section describes past, present, and reasonably foreseeable future actions that were not discussed in the Final Phase III ERP/PEIS, but which are relevant to identifying any cumulative impacts the proposed Osprey Restoration in Coastal Alabama may have on a local scale. Context and intensity, defined in Section 9.2.5, are used to determine whether a potential significant cumulative impact from the Osprey Restoration in Coastal Alabama exists.

For the Osprey Restoration in Coastal Alabama , specifically, the relevant affected resources analyzed in this EA are:

- Geology and Substrates
- Noise
- Wildlife and Wildlife Habitat, including Threatened and Endangered Species
- Aesthetics and Visual Resources

Those resources described in section 9.2.5 as considered but not carried forward for further analysis would not have impacts and therefore, would not have cumulative impacts. Local and site-specific past, present and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS were identified through conversations with ALDCNR staff and searching websites relevant to Osprey Restoration in Coastal Alabama. The local action area is defined as the five proposed platform locations and immediate surroundings of those areas. Actions that would be relevant to the cumulative impacts analysis for Osprey Restoration in Coastal Alabama are defined here as those with similar scope, timing, impacts or location. Websites searched include:

- http://www.nfwf.org/whoweare/mediacenter/pr/Pages/gulf-main-pr-14-1117.aspx
- http://eli-ocean.org/gulf/restoration-projects-database/

This search provided no additional information on actions that are relevant to Osprey Restoration in Coastal Alabama cumulative impacts analysis. The potential for cumulative impacts is further limited due to the small and localized nature of the Osprey Restoration in Coastal Alabama.

9.2.6.2 Phase III or Proposed Phase IV Projects

Due to the small scale, minor, local and temporary impacts from the project, Osprey Restoration in Coastal Alabama is not anticipated to contribute to potential adverse cumulative impacts in combination with other Phase III or IV projects. In terms of location, the closest Phase IV proposed project to Osprey Restoration in Coastal Alabama is the Trail Enhancement at Bon Scour NWR project. That project consists of trail enhancements and a construction of a view platform at Bon Secour NWR, which is in the vicinity of the Little Lagoon proposed platform. Cumulatively, these two projects would not produce adverse environmental impacts because of their distance, timing, and small scale. One nesting platform target area is also located in the vicinity of the Gulf State Park Enhancement Project (trails component). Due to the short nature of construction (less than one day), construction of both projects is not expected to occur at the same time and operation of the projects would not be expected to cumulative contribute to any adverse impacts due to the small and localized nature of the proposed nesting platforms.

Osprey Restoration in Coastal Alabama would be expected to contribute long term beneficial impacts to wildlife and wildlife habitat. Accordingly, Osprey Restoration in Coastal Alabama would not contribute adverse cumulative impacts when added to past, present or reasonably foreseeable future actions.

9.2.7 Summary and Next Steps

The proposed Osprey Restoration in Coastal Alabama would include establishment of five osprey nesting platform which would provide additional nesting habitat. The project is consistent with Alternative 4 (Preferred Alternative) of the Final Phase III ERP/EIS. NEPA analysis of the environmental consequences suggests that while minor adverse impacts to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would provide long-term benefits by creating habitat. The Trustees have started coordination and reviews under the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, the National Historic Preservation Act, the Marine Mammal Protection Act, the Bald and Golden Eagle Protection Act, and other federal statutes. Pursuant to the Coastal Zone Management Act of 1972, federal actions must be consistent with the federally approved coastal management programs for states where the activities would affect a coastal use or resource of the state. The Federal Trustees' consistency determination for this project was submitted to the Alabama Department of Environmental Management (ADEM) on May 21, 2015. Via letter dated June 24, 2015, ADEM concurred with that determination of consistency with the enforceable policies of the Alabama Coastal Area Management Program for these proposed activities.

The consultations for both ESA and MSFCMA are complete. For ESA compliance, NOAA determined that this project selected for implementation in Phase IV of the DWH Early Restoration Plan will have No Effect to listed species under the jurisdiction of National Marine Fisheries Service. For MSFCMA, NOAA determined that this project will have No Adverse Impacts to EFH under the jurisdiction of the National Marine Fisheries Service. The Trustees have completed coordination and reviews with NOAA under the Marine Mammal Protection Act. Coordination and informal consultation under the ESA, MBTA and BGEPA has been completed. The USFWS concurred that no threatened, endangered, or candidate

species or critical habitat or other protected species would be adversely affected as a result of implementing this proposed project.

The Trustees have initiated coordination and review under Section 106 of the NHPA. A complete review of this project will be completed prior to project implementation. NHPA Section 106 and Tribal consultations may further identify potential cultural resources in the project areas and any mitigation measures necessary to protect those resources.

The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. Public comments and Trustee responses are found in Chapter 15.

9.3 References

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10.1 Point aux Pins Living Shoreline Project: Project Description

10.1.1 Project Summary

The Point aux Pins Living Shoreline Project is intended to employ living shoreline techniques that utilize natural and/or artificial breakwater materials to stabilize shorelines along an area in Portersville Bay in the Mississippi Sound near Point aux Pins in Mobile County, Alabama. As the lead implementing Trustee, the Alabama Department of Conservation and Natural Resources (ADCNR) will create breakwaters to dampen wave energy and reduce shoreline erosion while also providing habitat and increasing benthic secondary productivity. The project will be located adjacent to an existing living shoreline project previously constructed by the ADCNR utilizing other funding sources.

Construction activities will include placement of breakwater materials along the shoreline. The specific breakwater elevations, construction techniques and design will be developed to maximize project success and meet regulatory requirements. Over time, the breakwaters are expected to provide habitat that supports benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, crabs, and small forage fishes. The project location and layout are shown in Figure 10-1 and Figure 10-2.

10.1.2 Background and Project Description

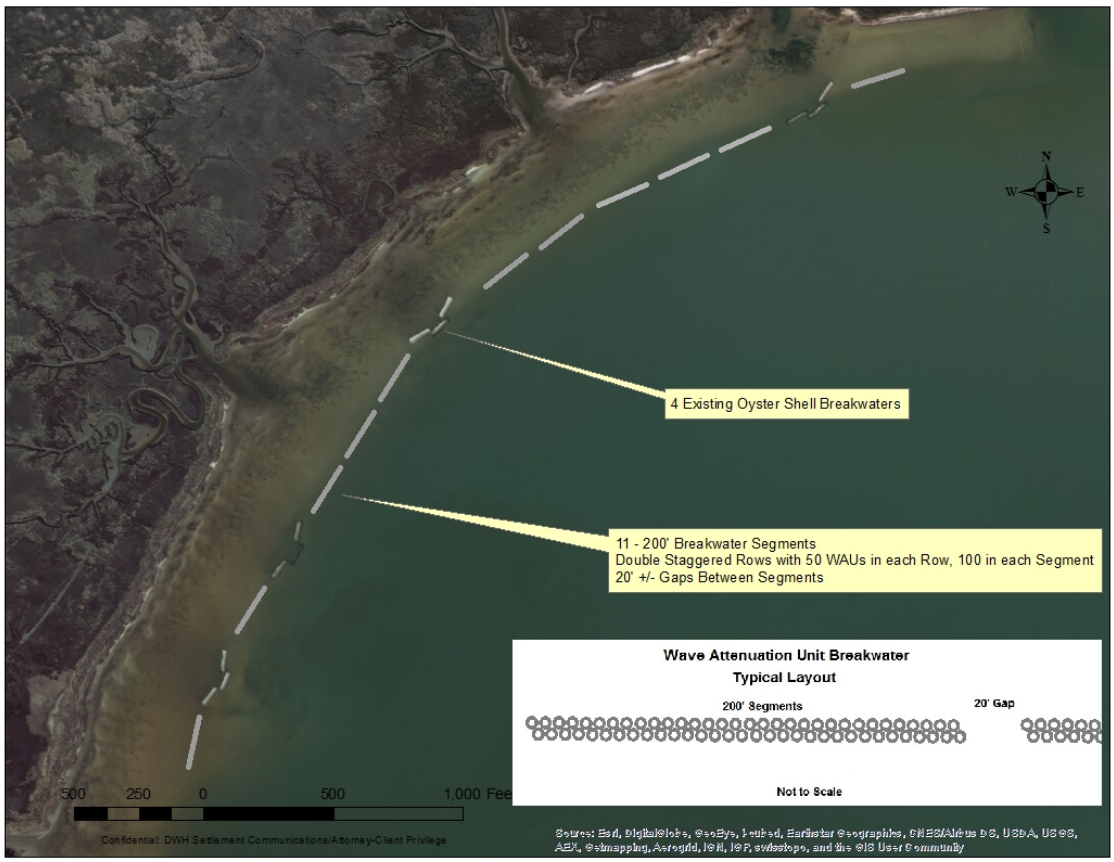
The shoreline in the project area is oriented to the southeast on Portersville Bay in Mississippi Sound in Alabama state waters. A continuous, fringing band of smooth cordgrass (*Spartina alterniflora*) is present along most of the shoreline. Escarpments only occur intermittently, particularly in the northern reaches of the site, where the coast bends to the northeast. Monospecific stands of saltmeadow cordgrass (*Spartina patens*) and patches of black needlerush (*Juncus roemerianus*) lie shoreward of the smooth cordgrass zone (Moody et al. 2013).

This approximately one mile shoreline shows evidence of erosion over time and appears to indicate a net loss (Moody et al. 2013). Natural and/or artificial breakwaters will be constructed to protect the shoreline and salt marsh habitat, and increase benthic secondary productivity. Building upon knowledge gained from prior projects, a living shoreline approach will be employed along the shoreline. Construction activities will include placement of nearshore intertidal breakwaters that may utilize artificial Wave Attenuation Units (WAUs) and will generally follow a +0.5 to +1.0 foot Mean Lower Low Water (MLLW) target crest elevation. The breakwaters will likely have 10 foot crest widths, based on desired wave reduction, and will be designed with a height that falls within the mean high and low water lines (intertidal). The specific breakwater elevations and technique designs will be selected to maximize shoreline protection and meet federal and state regulatory requirements. Over time, the breakwaters are expected to provide habitat that supports benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, crabs and forage fishes.

Figure 10-1. Site Location



Figure 10-2. Project Layout



10.1.3 Evaluation Criteria

This project meets the evaluation criteria established by OPA regulations and the Framework Agreement. The north central Gulf coast experienced a loss of salt marsh habitat and benthic secondary productivity, including oyster reefs, as a result of the Spill. The project will restore injured benthic secondary productivity by constructing breakwaters, enhance injured salt marsh habitat by reducing future erosion, and compensate for interim losses of salt marsh habitat and benthic secondary productivity in Alabama caused by the Spill. Thus, the nexus to resources injured by the Spill is clear (*see* 15 C.F.R. § 990.54(a)(2) and Sections 6a-6c of the Early Restoration Framework Agreement).

The project is technically feasible, utilizes commonly used restoration techniques and can be implemented with minimal delay. Several studies of living shoreline techniques have found that these projects can successfully reduce shoreline erosion while providing habitat and water quality benefits (LaPeyre, et al. 2013[1], Scyphers et al. 2011[2], Berman et al. 2007[3]). Government agencies, non-governmental organizations, and private citizens have successfully implemented similar living shoreline projects in Mobile Bay. A living shoreline was successfully implemented at Northeast Point aux Pins to evaluate their effectiveness at reducing erosion (Moody et al. 2013). For these reasons, the project has a high likelihood of success (See 15 C.F.R. § 990.54(a)(3) and Section 6e of the Early Restoration Framework Agreement).

A thorough environmental assessment, including review under applicable environmental statutes and regulations, is described in Section 10.2; that preliminary review indicates that adverse effects from the project will largely be minor, localized, and of short duration. In addition, the best management practices and measures to avoid or minimize adverse effects described in Section 10.2 will be implemented. As a result, collateral injury will be avoided or minimized during project implementation (15 C.F.R. § 990.54(a)(4)).

Cost estimates are based on similar past projects, which indicate the project can be conducted at a reasonable cost (see C.F.R. § 990.54(a)(1)). Therefore, the project is considered feasible, cost effective, and consistent with long-term restoration needs (see C.F.R. § 990.54(a)(1),(3), and Sections 6d-6e of the Early Restoration Framework Agreement).

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[1] La Peyre, M.K., Schwarting, Lindsay, and Miller, Shea, 2013, Preliminary assessment of bioengineered fringing shoreline reefs in Grand Isle and Breton Sound, Louisiana: U.S. Geological Survey Open-File Report 2013–1040, 34 p.

[2] Scyphers, S.B., SB, Powers, S.P., SP, Heck, K.L. KL Jr.,,, Byron, D. (2011) Oyster Reefs as Natural Breakwaters Mitigate Shoreline Loss and Facilitate Fisheries. PLoS ONE 6(8): e22396. doi:10.1371/journal.pone.0022396.

[3] Berman, Marcia, Harry Berquist, Julie Herman, Karinna Nunez, 2007. The Stability of Living Shorelines – An Evaluation: Final Report submitted to NOAA Chesapeake Bay Program Office under grant number NA04NMF4570358.

10.1.4 Performance Criteria and Monitoring

The overall goal of this restoration project is to reduce erosion through reduction of wave height and energy while enhancing the ecosystem productivity of the area. Monitoring activities at the Point aux Pins site are planned over a 5-year period. This monitoring approach will incorporate a mix of quantitative and qualitative monitoring efforts to ensure project designs are correctly implemented during construction and in a subsequent period, as defined by contract developed for this effort, where corrective actions could be taken by the implementing Trustee (ADCNR) to ensure the project meets the following objectives.

The specific restoration objectives relevant for this monitoring plan are: 1) construction of breakwater segments that meet project design criteria and that are sustained for the expected lifespan of the project to support benthic secondary productivity and reduce shoreline erosion, 2) support habitat utilization of the breakwater segments by invertebrate infauna and epifauna to increase secondary benthic productivity at the project site, and 3) reduction of shoreline erosion to protect existing salt marsh habitat. The monitoring plan for this project is included in Appendix B.

Performance criteria will be used to determine restoration success or the need for corrective action (15 C.F.R. § 990.55(b)(1)(vii)). For restoration projects, since full recovery may occur over a long time frame, performance criteria typically represent interim milestones that will help project managers determine if the project is yielding improvements along an acceptable trajectory. The specific performance criteria and details for subsequent monitoring for this project are provided in the monitoring plan provided in Appendix B.

10.1.5 Maintenance

There will be no short- or long-term maintenance activities required for these structures due to the materials being utilized. As navigational signage weathers and wears it will be replaced as appropriate, but this will involve replacing the sign face and will not include additional ground disturbance.

10.1.6 Offsets

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Resource Equivalency Analysis (REA) and Habitat Equivalency Analysis (HEA) to estimate appropriate biological and habitat Offsets for the Point aux Pins Living Shoreline Project. Habitat Offsets (expressed in DSAYs[4]) were estimated for salt marsh habitat protected by this restoration project, based on the expected spatial extent and duration of improvements attributable to the project. In estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, anticipated protection of existing marsh provided by the project and the time period over which the project will continue to

[4] **Discounted Service Acre Years (DSAYs)** are defined in Appendix C.

provide benefits. The Trustees and BP agreed that if this restoration project is selected for implementation, BP will receive Offsets of 29 DSAYs of Salt Marsh Habitat[5], applicable to Salt Marsh Habitat injuries in Alabama, as determined by the Trustees' total assessment of injury for the Spill.

If the combination of Offsets for Salt Marsh Habitat injuries from the Phase I and Phase III early restoration projects in Alabama and from the Point aux Pins Living Shoreline Project exceeds the Salt Marsh Habitat injuries in Alabama, then the remaining unused Salt Marsh Habitat DSAYs from this project will be converted to Secondary Productivity[6] (at a rate of 1,000 Dkg-Ys of Secondary Productivity per Salt Marsh Habitat DSAY) and applied to Estuarine Dependent Aquatic Biomass[7] injuries first in Alabama waters and then, if that category of injury is exhausted in Alabama waters, to such injury in federal waters on the Continental Shelf. These NRD Offsets for Salt Marsh Habitat (and, if applicable, Secondary Productivity) shall not apply to injuries in Texas, Louisiana, Mississippi and/or Florida.

Benthic Secondary Productivity Offsets (expressed in Dkg-Ys[8]) were estimated for expected increases in invertebrate infaunal and epifaunal biomass attributable to the restoration project. In estimating Dkg-Ys, the Trustees considered a number of factors, including, but not necessarily limited to, typical productivity in the project area, estimated project lifespan and project size. The Trustees and BP agreed that if this restoration is selected for implementation, BP will receive Offsets of 29,101 Dkg-Ys of benthic Secondary Productivity, applicable to benthic Secondary Productivity injuries in Alabama, as determined by the Trustees' total assessment of injury for the Spill.

If the combination of Offsets for benthic Secondary Productivity from the Phase III early restoration projects in Alabama and from this Point aux Pins Living Shoreline Project exceeds the injury to benthic Secondary Productivity in Alabama waters then the remaining unused Offsets for benthic Secondary Productivity from this project will be applicable to injuries to Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat[9] at a rate of 5 Dkg-Ys of Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat per 100 Dkg-Ys benthic Secondary Productivity (up to a maximum of 1,455 Dkg-Ys of Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat). These remaining Offsets will be applied first to offset such injuries in Alabama waters and then, if that category of injury is exhausted in Alabama waters, to such injuries in federal waters on the Continental Shelf. These NRD Offsets for benthic Secondary Productivity (and, if applicable, Estuarine Obligate Fishes and Mobile Crustaceans Dependent

[5] **Salt Marsh Habitat** is defined in Appendix C.

[6] **Secondary Productivity** is defined in Appendix C.

[7] **Estuarine Dependent Aquatic Biomass** is defined in Appendix C.

[8] **Discounted kilogram-years** is defined in Appendix C.

[9] **Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat** is defined in Appendix C.

on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat) shall not apply to injuries in Texas, Louisiana, Mississippi and/or Florida.

Appendix C provides further definitions for the Offsets detailed in this section. These Offset types and amounts are reasonable for this project.

10.1.7 Estimated Cost

The estimated cost for this project is $2,300,000. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, design, implementation, monitoring, and potential contingencies.

10.2 Point aux Pins Living Shoreline Project: Environmental Assessment

The proposed restoration project involves placement of breakwater segments located in the Mississippi Sound near Point aux Pins in Mobile County, Alabama. The specific breakwater elevations, construction techniques and design would be developed to maximize project success and meet federal and state regulatory requirements.

10.2.1 Introduction, Background, Purpose and Need

CEQ encourages federal agencies to "tier" their NEPA analyses from other applicable NEPA documents to create efficiency and reduce redundancy, and has issued new guidance on the use of programmatic NEPA documents for tiering (CEQ 2014a).

Tiering has the advantage of not repeating information that has already been considered at the programmatic level so as to focus and expedite the preparation of the tiered NEPA review(s). When a programmatic environmental assessment (PEA) or programmatic environmental impact statement (PEIS) has been prepared and an action is one anticipated in, consistent with, and sufficiently explored within the programmatic NEPA review, the agency need only summarize the issues discussed in the broader statement and incorporate discussion from the broader statement by reference and concentrate on the issues specific to the subsequent tiered proposal (CEQ 2014a).

A federal agency may prepare a PEIS to evaluate broad actions (40 C.F.R. § 1502.4(b); see Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18026 (1981)). When a federal agency prepares a PEIS, the agency may "tier" subsequent narrower environmental analyses on site-specific plans or projects from the PEIS (40 C.F.R. § 1502.4(b); 40 C.F.R. § 1508.28). Federal agencies are encouraged to tier subsequent narrower analyses from a PEIS to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review (40 C.F.R. § 1502.20). The 2014 Final Programmatic and Phase III Early Restoration Plan and Programmatic Environmental Impact Statement (Final Phase III ERP/PEIS) was prepared for use in tiering subsequent early restoration plans and projects, such as Phase IV.

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the programmatic portion of the Final Phase III ERP/PEIS. This EA qualifies for tiering from the Final Phase III ERP/PEIS in accordance with Department of the Interior regulations (43 C.F.R. § 46.140, Using Tiered Documents, b and c).

This project type is consistent with the Final Phase III ERP/PEIS's Preferred Alternative as described in the 2014 Record of Decision (79 Fed. Reg. 64831-64832 (October 31, 2014)) and the Trustees find that the conditions and environmental effects described in the broader NEPA document (with updates as described in Chapter 2) are valid. Specifically, this project tiers from the analyses found in sections of the PEIS that describe Alternative 4 (Preferred Alternative: Contribute to Restoring Habitats, Living Coastal and Marine Resources and Recreational Opportunities) under Project Type 2: Protect Shorelines and Reduce Erosion including Section 5.3.3.2 and Environmental Consequences, Section 6.3.2. This EA incorporates by reference the analysis found in the PEIS in those sections. This EA also incorporates by

reference all Early Restoration introductory, process, background, and Affected Environment information and discussion provided in the PEIS (Chapters 1 through 6).

10.2.1.1 Background

The shoreline in the project area is oriented to the southeast on Portersville Bay in Mississippi Sound in Alabama state waters. A continuous, fringing band of smooth cordgrass (*Spartina alterniflora*) is present along most of the shoreline. Escarpments occur intermittently, particularly in the northern reaches of the site, where the coast bends to the northeast. Monospecific stands of saltmeadow cordgrass (*Spartina patens*) and patches of black needlerush (*Juncus roemerianus*) lie shoreward of the smooth cordgrass zone (Moody et al. 2013).

This approximately one mile shoreline shows evidence of erosion over time and appears to indicate a net loss (Moody et al. 2013). Natural and/or artificial breakwaters would be constructed to protect the shoreline and salt marsh habitat, and increase benthic secondary productivity. Building upon knowledge gained from prior projects, a living shoreline approach would be employed along the shoreline. Construction activities would include placement of nearshore intertidal breakwaters that may utilize artificial WAUs and would generally follow a +0.5 to +1.0 foot MLLW target crest elevation. The breakwaters would likely have 10 foot crest widths, based on desired wave reduction, and would be designed with a height that falls within the mean high and low water lines (intertidal). The specific breakwater elevations and technique designs would be selected to maximize shoreline protection and meet federal and state regulatory requirements. Over time, the breakwaters are expected to develop into habitat that supports benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, crabs and forage fishes.

10.2.1.2 Purpose and Need

The purpose and need for this action falls within the scope of the purpose and need of the programmatic portions of the Final Phase III ERP/PEIS because it would accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. The proposed project's purpose is to restore for natural resources injured in Alabama as a result of the *Deepwater Horizon* incident. The proposed project would provide habitat and increase benthic secondary productivity thus enhancing resources in coastal Alabama that were damaged as a result of the Spill. The proposed project is needed to protect and enhance coastal resources.

10.2.2 Scope of the EA

This project is proposed as part of Phase IV of Early Restoration. This EA tiers from the Final Phase III ERP/PEIS. The broader environmental analyses of these types of actions as a whole are discussed in the Final Phase III ERP/PEIS from which this EA is tiered. The information and analysis in this document supplements the programmatic analysis with site-specific information. This EA provides NEPA analysis for potential impacts for site specific issues and concerns anticipated from implementation of the proposed action and the No Action Alternative.

The Trustees' Early Restoration project selection process is described in Section 2.1 of the Final Phase III ERP/PEIS. As described there, potential projects evolve from public scoping, ongoing public input through internet-accessible databases, review of current federal and state management plans and programs, and Trustee expertise and experience. From this broad list of project ideas, the Trustees' Early Restoration project selection process initially results in a set of proposed projects that, consistent with the Framework Agreement, are submitted to BP for review and consideration. One area considered for Early Restoration included protection of shorelines and measures to reduce erosion.

10.2.3 Project Alternatives – No Action Alternative

Both OPA and NEPA require consideration of the No Action alternative. For this section, there are two alternatives, the No Action and Proposed Action, Point aux Pins Living Shoreline Project.

Under the No Action alternative the Trustees would not pursue the Point aux Pins Living Shoreline Project as part of Phase IV Early Restoration. Under No Action, the existing conditions described in Chapter 3 of the Final Phase III ERP/PEIS would prevail. Restoration benefits associated with this project would not be achieved at this time.

10.2.4 Project Alternatives – Proposed Action

10.2.4.1 Project Location

The proposed Point aux Pins Living Shoreline project is located in south Mobile County in coastal Alabama. The proposed project area is located near an intertidal salt marsh south of the town of Bayou la Batre in Portersville Bay on the northern side of Mississippi Sound in Alabama state waters (see Figure 10-1 and Figure 10-2).

10.2.4.2 Project Scope

The proposed Point aux Pins Living Shoreline project would employ living shoreline restoration techniques by creating rows of approximately 200 foot breakwater segments made of WAUs. In total 11 segments are proposed with an approximate 20' gaps between each segment. The exact number of segments may vary depending on final project design. The specific breakwater elevations and number of segments, construction techniques and design would be developed to maximize project success and meet regulatory requirements. It is anticipated that construction of the breakwaters would take place using shallow draft barges and tugs to transport the breakwater units. A small track-hoe or other similar equipment located on the barge would then be utilized to place the breakwater units in the appropriate configuration. However, actual equipment and construction techniques would be determined by the selected contractor and conducted in compliance with all permit conditions and best management practices.

Over time, the breakwaters are expected to provide habitat that supports benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, crabs, and small forage fishes.

The implementation of the Point aux Pins Living Shoreline project would take approximately 9 months and would include the following activities:

- Planning, site investigations, and design - approximately 6 months, concurrently it would take approximately 3-4 months for permitting and consultation.
- Construction – approximately one month.

Upon completion of planning, design and permitting, a request for construction bids would be issued and a contract for construction issued in accordance with Alabama bid and procurement laws and regulations. It is anticipated that construction of the breakwaters would take place using shallow draft barges and tugs to transport the breakwater units. A small track-hoe or other similar equipment located on the barge would then be utilized to place the breakwater units in the appropriate configuration. However, actual equipment and construction techniques would be determined by the selected contractor and conducted in compliance with all permit conditions and best management practices.

No maintenance activities would be required due to the materials being utilized. As navigational signage weathers and wears it would be replaced as appropriate, but this would involve replacing the sign face and would not include additional ground disturbance.

10.2.5 Affected Environment and Environmental Consequences

Under the NEPA, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

In order to determine whether an action has the potential to result in significant impacts, the **context and intensity** of the action must be considered. **Context** refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). **Intensity** refers to the severity of impact and could include the timing of the action (e.g., more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse.

For purposes of this document, impacts are characterized as minor, moderate or major, and temporary or long-term. The analysis of beneficial impacts focuses on the duration (short- or long-term), without attempting to specify the intensity of the benefit. The definition of these characterizations is consistent with that used in the Final Phase III ERP/PEIS, and can be found in Appendix D.

According to the CEQ Regulations for Implementing NEPA (Section 1502.1 and 1502.2) agencies should "focus on significant environmental issues" and for other than significant issues there should be "only enough discussion to show why more study is not warranted." The programmatic environmental analysis looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resources that are not expected to be affected are considered but not evaluated

further. For this project, the resource areas that have not been analyzed in detail are listed below, along with the reasons why they are not expected to be affected.

- Socioeconomics/Environmental Justice: The socioeconomic environment consists of demographics, the local and regional economy, and environmental justice. Executive Order 12898 (General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) requires all agencies to incorporate these topics into their environmental assessments by identifying and addressing disproportionately high and adverse human health or environmental effects of their proposed actions on minorities and low-income populations or communities. Placement of wave attenuation units would not result in a net change of the current racial and ethnic composition, existing industries, or employment in Mobile County. Furthermore, no environmental effects on minorities or low-income populations—as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996)—are expected. Therefore, the socioeconomic environment is not carried forward for detailed analysis in this assessment.

- Noise: Noise from the construction equipment would be evident in the project area, which would occur entirely from a barge. While this noise would be evident to those workers on the job and any users of the shoreline in proximity to the project, it would be short-term and negligible. Return to normal noise levels would be achieved at the end of each workday and after completion of the job. The project is not anticipated to increase vessel traffic or noise impacts in the long term. Because impacts from noise would be at low levels and short-term this impact area is not carried forward for detailed analysis in this assessment.

- Infrastructure: The project area is along the northeastern shoreline of Point aux Pins in the western portion of Portersville Bay, Alabama. There is a road approximately one half mile inland from the shore in this area. The land is not developed for human habitation; therefore, there are no structures for water supply or utilities within half a mile from the land adjacent to project area. At this time, it is anticipated that the construction contractor would use existing land based docks and loading areas to stage breakwater materials and construction equipment, which would not adversely affect local roadway networks or other existing infrastructure. All the construction activities should be performed from water based resources with no activities on the shoreline adjacent to the site. Because existing infrastructure would not be used for construction or affected by construction or operation this impact area is not carried forward for detailed analysis in this assessment.

For those resources carried forward for detailed analysis, the analysis first considers if the impacts of the proposed project are within the impacts evaluated for the project type within the Final Phase III ERP/PEIS. After consideration of how the impacts of the proposed project are evaluated in context of the programmatic document, site specific impacts are evaluated.

10.2.5.1 Physical Environment

Geology and Substrates

Affected Resources

Geology

Mississippi Sound is within the East Gulf Coast Plain physiographic province. This physiographic province is bounded by the fall line to the north and by coastal lowlands to the south and is generally characterized by subtle topography and diverse estuarine and tidal areas. The Point aux Pins site and study area falls within the Gulf Barrier Islands and Coastal Marshes Level IV Ecoregion.

Subaqueous Soils

The sediments of the Mississippi Sound range from sand to clays with various mixtures of sand, silt, and clay covering most of the bay bottom (USGS 2007). Soils at the Point aux Pins Living Shoreline project site are primarily Axis mucky sandy clay loam, which is a very poorly drained soil with frequent flooding and ponding (Soil Survey Staff 2015).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to geology and substrates would occur. The beneficial impacts from implementation of this project, including a reduction in shoreline erosion and habitat enhancement, would not be realized.

Proposed Action

Sections 6.3.2 and 6.7.1.1 of the Final Phase III ERP/PEIS describe the impacts to geology and substrates from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that placement of breakwaters could benefit geology and substrates by reducing erosion and increasing the lifespan of shorelines near passes, inlets, or in areas where erosion rates are high and sediment supply is limited. These beneficial effects would be long-term because they would last beyond the construction period. It also noted that there would be the potential for short-term impacts to geology and substrates from installation of shore protection systems. Use of equipment in submerged substrates would disturb sediments; these actions would result in short-term minor adverse effects limited to the area where construction activity occurred. For this project, impacts to geology and substrates were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

The geological and substrate resources in the project area would be affected through the modification of soft bottom bay habitat into breakwaters (hardened substrate). The project footprint would occur in fine-grained sediment and soft bottoms would be covered with breakwater units. Additionally,

appropriate signage for marine traffic would be placed on approximately 12-inch diameter posts and would be installed adjacent to the breakwaters, which would impact a small area of soft bottom. Construction of all elements is anticipated to take one month. A full schedule would be dependent on the date funding becomes available and contractor award times.

There would be short term, minor, adverse impacts to geology and substrates due to disturbance from the placement of hard, structural material over soft bottom. Because all work would occur from the water, and there would be no construction vehicles staged along the shoreline, there would not be any compaction along the shoreline from construction. A long term benefit to the bottom substrates would be expected due to stabilization of sediments by hardened reef structures, as well as long-term benefits to the shoreline from reduction in erosion.

A range of potential mitigation measures for impacts to geology and substrates are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs planned to be implemented for this effort would include employment of standard BMPs for construction to reduce erosion.

Hydrology and Water Quality

Affected Resources

Water Quality

Mississippi Sound has salinity levels of 10 to 28 parts per thousand (ppt) (Northern Economics 2014). This is lower than the Atlantic Ocean's average salinity of 35 ppt, due in part to the sound's estuarine environment. Water quality in the area is considered to be impaired due to the presence of *Enterococcus* bacteria (USEPA 2012). Turbidity in the project area is a common occurrence due to shallow depths, silts, windy conditions, and storm events. The major point source of pollution in the Portersville Bay portion of Mississippi Sound (where the project is located) is municipal discharge/sewage from the Bayou la Batre wastewater treatment plant, which is regulated under a National Pollutant Discharge Elimination System (NPDES) permit. Non-point sources are limited to septic systems, sanitary sewer overflow, and general stormwater runoff.

Floodplains

The project is located in FEMA designated Flood Zones according to the Flood Insurance Rate Maps (FIRMS) for Mobile County. (FIRM No. 01097C0768K Mobile County, (effective date March 17, 2010). The project is located in Zone VE with base flood elevation of 15 feet. VE indicates coastal flood zones with velocity hazards (wave action) with base flood elevations determined.

Wetlands

The project is located in open water near emergent herbaceous wetlands and submerged aquatic vegetation (SAV). These wetlands are found directly north and west of the site. Emergent herbaceous wetlands are characterized by perennial non-woody plants, which can account for approximately 80 percent of the vegetative cover (MRLCC 2015). The soil or substrate in these wetlands is periodically

saturated or covered with water. Emergent wetlands include marshes, meadows, and fens. In addition, SAV beds are located landward (west and north) of the proposed breakwater units and are composed of *Halodule wrightii* (shoal grass) and *Ruppia maritima* (widgeon grass). These beds are normally submerged under all but the lowest tidal conditions.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to hydrology or water quality would occur. The beneficial impacts from implementation of this project, including a reduction in storm surges on coastal wetlands and limiting the shoreward extent of saltwater flow, a reduction in shoreline erosion and habitat enhancement would not be realized.

Proposed Action

Sections 6.3.2 and 6.7.2.1 of the Final Phase III/ERP PEIS describe the impacts to hydrology and water quality from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that shoreline protection and erosion reduction could result in long-term beneficial impacts by reducing storm surges on coastal wetlands, and limiting the shoreward extent of saltwater flow. During construction, minor short-term adverse impacts are possible due to the risk of water quality contamination from equipment usage and boating traffic in construction areas and a potential increase in turbidity. For this project, impacts to geology and substrates were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

Potential mitigation measures for impacts to each of the hydrology and water quality categories discussed below are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs planned to be implemented for this effort include:

- Employment of standard BMPs for construction to reduce erosion.
- During construction, BMPs, such as floating turbidity barriers, may be used to contain turbid water and reduce impacts to ambient water quality conditions.
- Clearly marking breakwater locations and placement of breakwater units seaward of SAV beds.
- Inclusion in construction documents clear and concise requirements and BMPS to avoid any impacts to SAV and adjacent wetland areas.

Hydrology

Tides, currents, and salinity would be unaffected because the proposed project would have a minimal footprint located adjacent to the shoreline. There would be no anticipated impacts from placement of the breakwater structures since each structure would have at least twenty foot gaps that would allow normal tidal fluctuation around the breakwaters. Further, the breakwaters would be porous and water would be able to interchange through the structure.

Water Quality

Short term minor impacts to water quality would result from increased turbidity during material placement. During construction, BMPs, such as floating turbidity barriers, may be used to contain turbid water and reduce impacts to ambient water quality conditions. In the long term, beneficial impacts are expected as the reefs are expected to contribute to localized water quality improvement due to the filtration capacity of oysters and other bivalves that would be anticipated to colonize the reefs. In terms of regulatory compliance, the placement of breakwaters as proposed under this project is considered "fill." No other fill and/or dredging would occur under this effort. The proposed discharge of fill material (placement of breakwaters) into waters of the United States, including wetlands, or work affecting navigable waters associated with this project will be coordinated with the U.S. Army Corps of Engineers (USACE) pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). Coordination with the USACE and final authorization pursuant to CWA/RHA would be completed prior to project implementation. A state water quality certification would be obtained from the Alabama Department of Environmental Management prior to construction.

Floodplains

The project is located below the MHWL and would not impact the floodplain in the project area.

Wetlands

The project would not adversely affect wetlands as the breakwaters would be placed in open water. After construction, there would be long-term beneficial impacts as the breakwaters would lead to protection of wetlands on the adjacent Point aux Pins site. The breakwaters would be anticipated to reduce wave energy reaching the shoreline and would help protect the fringe of salt marsh habitat and the adjacent palustrine wetlands.

Air Quality and Greenhouse Gas Emissions

Affected Resources

The EPA defines ambient air in 40 C.F.R. Part 50 as "that portion of the atmosphere, external to buildings, to which the general public has access." In compliance with the 1970 Clean Air Act (CAA) and the 1977 and 1990 Clean Air Act Amendments (CAAA), the EPA has promulgated National Ambient Air Quality Standards (NAAQS). Under the CAA, the EPA establishes primary and secondary air quality standards. Primary air quality standards protect the public health, including the health of "sensitive populations, such as people with asthma, children, and older adults." Secondary air quality standards protect public welfare by promoting ecosystems health, and by preventing decreased visibility, and damage to crops and buildings. The EPA has set NAAQS for the following six criteria pollutants: ozone, particulate matter (PM 2.5 and 10), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and lead. Individual states may promulgate their own ambient air quality standards for these "criteria" pollutants, provided that they are at least as stringent as the federal standards. In Table 10-1, below, both State of Alabama and federal primary ambient air quality standards for criteria air pollutants are

presented. The Mobile area is currently in attainment with NAAQS required by the EPA (40 C.F.R. Part 50) (USEPA 2015).

Table 10-1. State and federal ambient standards for criteria air pollutants

POLLUTANT	AVERAGING PERIOD	FEDERAL PRIMARY STANDARD	ALABAMA STATE STANDARD
Ozone	8-hour	0.075 ppm	Same as Federal
PM2.5	Annual (arithmetic mean)	12.0 µg/m3	Same as Federal
	24-hour	35 µg/m3	Same as Federal
PM10	24-hour	150 µg/m3	Same as Federal
Carbon Monoxide	8-hour	9 ppm	Same as Federal
	1-hour	35 ppm	Same as Federal
Nitrogen Dioxide	Annual (arithmetic mean)	0.053 ppm	Same as Federal
	1-hour	0.100 ppm	Same as Federal
Sulfur Dioxide	1-hour	75 ppb	Same as Federal

ppm = parts per million
ppb = parts per billion
Source: EPA, 2015 http://www.epa.gov/air/criteria.html
And http://www.adem.state.al.us/alEnviroReglaws/files/Division3.pdf

Greenhouse Gases

Greenhouse Gases (GHGs) are chemical compounds found in the Earth's atmosphere that absorb and trap infrared radiation as heat. Global atmospheric GHG concentrations are a product of continuous emission (release) and removal (storage) of GHGs over time. In the natural environment, this release and storage is largely cyclical. For instance, through the process of photosynthesis, plants capture atmospheric carbon as they grow and store it in the form of sugars. Human activities such as deforestation, soil disturbance, and burning of fossil fuels disrupt the natural cycle by increasing the GHG emission rate over the storage rate, which results in a net increase of GHGs in the atmosphere. The principal GHGs emitted to the atmosphere through human activities are carbon dioxide (CO2), methane, nitrous oxide, and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, with CO2 accounting for the largest quantities of GHG emitted.

Criteria air pollutants and GHG emissions are largely generated by electricity production, vehicular movements, and commercial and residential buildings using electricity. GHG emissions would result from both the implementation and operation of the proposed project from the use of vessels during construction and monitoring activities.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to air quality or GHG would occur.

Proposed Action

Sections 6.3.2 and 6.7.3.1 of the Final Phase III ERP PEIS describe the impacts to air quality and greenhouse gases from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that short-term minor to moderate adverse impacts to air quality in the project vicinity could occur from the use of construction equipment and the potential for short-term minor adverse impacts from fugitive dust. For this project, impacts to air quality and GHG were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

Potential mitigation measures for impacts to air quality and greenhouse gases are found in Appendix 6A of the Final Phase III ERP/PEIS. Any of these measures that would apply to the Point aux Pins Living Shoreline project may be used to minimize adverse impacts.

Air Quality

Project implementation would require the use of heavy equipment. Specifically, diesel-powered tugboats would be used to move barges and a small diesel track-hoe on the barges would be used to place the WAUs. This equipment would emit criteria pollutants such as PM2.5 and NO_2. However, the offshore emissions would not occur in proximity to sensitive receptors and the impact on ambient concentrations in the immediate vicinity of the construction activity would be temporary. No air quality permits are required for this type of project and violations of state air quality standards are not expected. Air quality impacts during construction are expected to be localized, minor, and short-term.

Greenhouse Gas Emissions

The use of gasoline and diesel-powered construction vehicles and equipment, including cars, trucks, cranes, crew boats, backhoes, small craft vessels, tugboats, and other equipment would contribute to a temporary increase in GHG emissions.

A unit of 25,000 metric tons of CO_2-equivelent[10] (CO_2e) GHG emissions per annum is used here as a threshold to gauge whether a more detailed analysis should be considered for construction period

[10] CO2-equivelent is a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). For example, methane has a GWP of 21, which means that methane will cause 21 times as much warming as an equivalent mass of carbon dioxide over a 100-year time period. Expressing GHG emissions on CO2-equivelent basis provides a common unit for comparing the total emissions of various GHGs.

emissions from the proposed project. The 25,000 metric tons of CO_2 provides a useful threshold for discussion and disclosure of GHG emissions because it has been used and proposed in rulemaking under the Clean Air Act (e.g., USEPA Mandatory Reporting of Greenhouse Gases Final Rule, 74 Fed. Reg. 56260, October 30, 2009). In addition, revised draft NEPA guidance from the CEQ on climate change and GHG effects also uses the reference point of 25,000 metric tons of CO_2e greenhouse gas emissions, although this figure is not a significance threshold (CEQ 2014b).

To determine if the proposed project has the potential to exceed 25,000 metric tons CO_2e, the potential emissions associated with tugboat operations were quantified. The analysis assumed a 650 horsepower (HP) diesel tugboat operating 8 hours per weekday for one month or 160 hours total. 650 HP is equivalent to 484.7 kilowatts. The equation for calculating emissions is as follows:

Emissions (grams) = engine power (kW) x LF x activity (hours) x EF (g/kW-hr)

Where:

engine power = rated engine power

LF = load factor for the engine

activity = hours at the given load

EF = emissions factor that expresses mass emissions (grams) in terms of kW-hrs (g/kW-hr)

The source of the tugboat engine emissions factors was an emissions inventory study conducted for the Port Authority of New York and New Jersey in 2012 (PANYNJ 2012). This study reported the following tugboat engine greenhouse gas emission factors:

- CO_2: 690 g/kW-hr
- N_2O: 0.08 g/kW-hr
- CH_4: 0.23 g/kW-hr

To ensure tugboat emissions were assessed conservatively, a load factor of 100% was used (engine operating at maximum power during all hours of operating). A more realistic load factor cited in the PANYNJ study for tugboat harbor operations is 31%.

Based on these assumptions, the total greenhouse gas emissions attributable to tugboat operations during construction are 56 tons CO_2-equivelent. Emissions from a small excavator on the barge would be considerably less than this value, therefore it can be concluded that total project emissions would be well under 25,000 metric tons CO_2-equivelent and further detailed greenhouse gas emissions analysis is not warranted.

Impacts from GHS emissions during construction are expected to be localized, minor, and short-term. Mitigation measures would further offset project GHG emissions and the project would have short-term, minor releases during construction. No long-term emissions of GHGs are anticipated.

Summary of Impacts to the Physical Environment

Impacts to the physical environment from implementation of the Point aux Pins Living Shoreline Project would include:

- Short term, minor, adverse impacts to geology and substrates due to disturbance from the placement of hard, structural material over soft bottom and long-term benefits to the bottom substrates due to stabilization of sediments by hardened reef structures, as well as long-term benefits to the shoreline from reduction in erosion.
- No impacts to floodplains or hydrology would occur. Short term minor impacts to water quality would result from increased turbidity during material placement with long term beneficial impacts as the reefs are expected to contribute to localized water quality improvement due to the filtration capacity of oysters and other bivalves that would be anticipated to colonize the reefs. Long-term beneficial impacts would also occur from the breakwater protection of wetlands.
- Minor short-term adverse impacts to air quality and GHG emissions would result from the use of construction equipment. Impacts would be localized and last only during the construction period.

10.2.5.2 Biological Environment

Alabama is ranked fifth in the nation for biodiversity, with a total of 4,533 different plant and animal species (Stein 2002). This distinction is mainly a result of the relatively high number of species of freshwater fish (297), marine animals (250), reptiles (85), amphibians (68), and vascular plants (2,902). This incredible species richness includes 144 endemic species, or organisms found only in the state of Alabama. The coastal ecosystems of the Mobile-Tensaw River Delta and Mississippi Sound provide valuable habitat to a large percentage of our diverse floral and faunal populations (MBNEP 2008).

The Mississippi Sound system supports an array of biological communities and species characteristic of a northern Gulf of Mexico estuary. Estuarine habitats include tidal flats, benthic microalgae communities, sea grass beds, oyster beds, tidal marshes, planktonic communities, and pelagic communities.

Living Coastal and Marine Resources

Living coastal and marine resources with the potential to be affected by the proposed action include: SAV; benthos, invertebrates and fish; EFH; marine mammals; terrestrial species; and threatened and endangered species. The affected environment and impacts for each of these resources under the No Acton and Proposed Action are discussed individually below. Overall impacts to living coastal and marine resources are summarized here for the no action and proposed action.

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to living coastal and marine resources would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Sections 6.3.2 and 6.7.6.1 of the Final Phase III ERP/PEIS describe the impacts to living coastal and marine resources for all topics discussed below (SAV; benthos, invertebrates and fish; EFH; marine mammals; terrestrial species; and threatened and endangered species) from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that placement of breakwaters and living shorelines would provide long-term benefits by protecting eroding wetlands and shallow water habitats and, in some cases, would allow for additional wetlands and shallow water habitat creation on the shore side of the constructed breakwaters. These actions would provide long-term benefits to benthic populations, pelagic microfaunal communities, and finfish, by increasing habitat and foraging areas.

Placement of breakwaters and living shorelines would require use of in-water heavy equipment and sediment placement, which would increase human activity, noise, vibration, and turbidity in the short-term. These activities could result in short-term, mostly minor, adverse impacts to species in the area from displacement and mortality of individual species. Long-term moderate impacts are possible due to displacement of sea turtles and shorebirds. For this project, impacts to living coastal and marine resources were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

Potential mitigation measures for impacts to each of the living and coastal marine resource categories discussed below are in Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would be implemented as part of this action include:

- Employment of standard BMPs for in-water construction.
- Development and implementation of spill prevention and control plans to minimize the risk of release of petroleum and oil products into receiving waters.
- Identification of mooring locations for restoration-related barges and other boats to best avoid EFH and minimize damage to existing healthy reefs or adjacent SAV beds.

The potential introduction of terrestrial and aquatic non-native invasive species of plants, animals, and microbes is a concern for any proposed project. Non-native invasive species could alter existing terrestrial or aquatic ecosystems, may cause economic damages and losses, and are the second most common reason for protecting species under the Endangered Species Act. The species that are or may become introduced, established, and invasive are difficult to identify. The analysis focuses on pathway control or actions/mechanisms that may be taken or implemented to prevent the spread of invasive

species on site or introduction of species to the site. Surveys have not been conducted to determine if invasive species are present.

This project involves placement of artificial breakwater material. A variety of in-water construction equipment would be used. Each of these actions and pieces of equipment serve as a potential pathway to introduce or spread invasive species. BMPs would be implemented to ensure these pathways are "broken" and do not spread or introduce species (See BMPs listed below). The implementation of these BMPs meets the spirit and intent of EO 13112. Due to the implementation of BMPs, the Trustees expect risk from invasive species introduction and spread to be short-term and minor.

The Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review would result in the avoidance and minimization of the introduction and spread of invasive species:

- All equipment to be used during the project, including personal gear, would be inspected and cleaned such that there is no observable presence of mud, seeds, vegetation, insects and other species.
- Breakwater habitat material would be treated or inspected to remove "non-target" species.
- Cleaning of construction equipment as needed before moving between sites to prevent spread of invasive species.

Submerged Aquatic Vegetation

Affected Resources

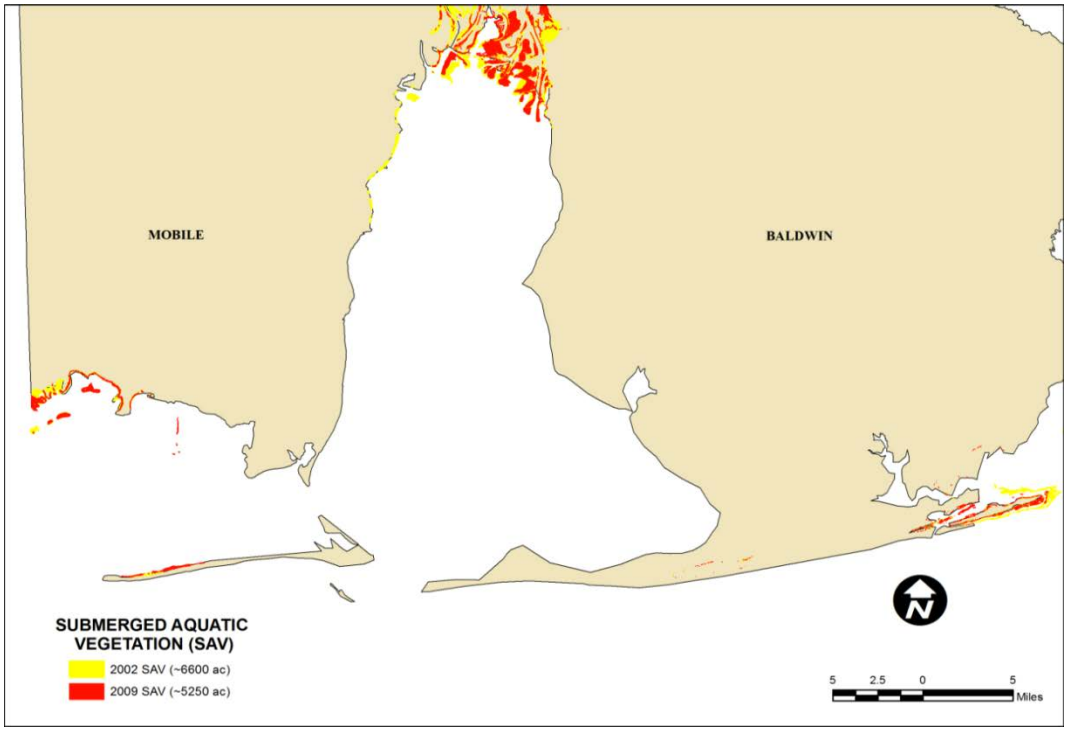
Submerged aquatic vegetation consists of rooted vascular plants that grow in fresh, brackish, and saltwater. These beds of SAV provide important foraging grounds and habitats for many species in the Gulf of Mexico. Earlier SAV inventories of Mobile Bay (Stout et al. 1982; USACE 1985) identified as many as 20 species of SAV occurring in the shallow shoreline areas of Mobile Bay. Data show that through the 1960s and 1970s, grass beds in the bay have steadily declined. Historically, a combination of changes has occurred to produce a decline in submerged grass beds in Mobile Bay. Recent studies of SAV coverage in Mobile Bay have been conducted by the Mobile Bay National Estuary Program and ADCNR. Results of these coverage studies indicate that between 2002 (the first mapping date) and 2009, SAV coverage in Mobile Bay has continually declined overall with increases in coverage in lower Perdido Bay and large-scale fluctuations in coverage in Mississippi Sound (Vittor and Associates 2009).

The largest factor contributing to SAV decline in Mobile Bay and nearby waters is ambient water quality, specifically nutrients and turbidity. Turbidity can be defined as muddiness created by stirring up sediment or having foreign particles suspended in the water column. The turbid water commonly seen in Mobile Bay is due to its shallow depth and high suspended sediment load (4.85 million metric tons per year), which represents turbidity caused by both natural and anthropogenic factors. Turbidity negatively affects SAV by reducing light penetration through the water column. Stormwater runoff contributes to high turbidity levels by delivering sediments into the water column and providing nutrients that stimulate algae growth.

Over-enrichment of nutrients (particularly nitrogen) comes from the use of agricultural and household fertilizers on fields and lawns as well as waste from animals. Other human activities detrimental to SAV survival include recreational and commercial boating, which causes a re-suspension of sediments (increase in turbidity) from propellers and boat wakes along bay edges. Further, grounding of outboard motor props rips sea grass and harms rhizomes, leaving behind "prop scars" that can take three to five years to recover (MBNEP 2008). Some other human activities impacting SAV growth include commercial and recreational trawling, which disturbs the substrate in which the plants grow and increases turbidity by stirring up sediments, and deposition of dredge material (MBNEP 2008).

SAV in the Mobile Bay and Mississippi Sound were systematically evaluated using aerial photographs in 2002, 2004, and 2009. The most recent SAV mapping efforts conducted by the ADCNR and MBNEP (Vittor and Associates 2009) indicated extensive SAV beds landward of the proposed breakwater locations see Figure 10-3. However, no construction activities would take place in these SAV beds and appropriate BMPs would be utilized to protect these resources.

Figure 10-3. Submerged Aquatic Vegetation distribution between 2002 and 2009



Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to SAV would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

No short- or long-term adverse effects to SAV are expected as this resource would be avoided during construction. Long-term benefits would occur to the near-shore water column (quality and movement) may create a more suitable environment for SAV establishment.

Benthos, Invertebrates, and Fish

Affected Resources

Vittor and Associates, Inc. (1982) named several opportunistic benthic species that are ubiquitous near the Gulf of Mexico's shores. These species, though sometimes low to moderate in abundance, occur in a wide range of environmental conditions. They are usually the most successful at early colonization and thus tend to strongly dominate the sediment after disturbances. These species include bristleworm (*Mediomastus spp.; Myriochele oculata; Sigambra tentaculata; Linopherus-Paraphinome; Magelona cf. phyllisae*), Fringe-gill Mudworm (*Paraprionospio pinnata*), Owenia worm (*Owenia fusiformis*), and Lumbrineris worm (*Lumbrineris spp.*). Bristleworm and Owenia worm are the predominant genera in Mississippi Sound.

Data collected between 1981 and 2003 concerning selected species such as brown shrimp (*Penaeus aztecus)*, white shrimp (*Penaeus setiferus*), pink shrimp (*Penaeus duararum*), blue crab (*Callinectes sapidus*), lesser blue crab (*Callinectes similis*), hardhead catfish (*Arius felis*), Gulf butterfish (*Peprilus berti*), white trout (*Cynoscion arenarias*), Gulf menhaden (*Brevooria patrouis*), spot (*Leiostomus xanthurus)*, and Atlantic croaker (*Micropogonias undulatus*) were evaluated to summarize species status, to identify species requiring additional management, and to make recommendations to increase their abundance (Valentine et al. 2006). In 2008, another statistical analysis of Fisheries Assessment and Monitoring Program data sets from 1981 through 2007 was completed (Riedel, et. al 2010). Both studies were in agreement that, for most species, no significant changes in abundance were revealed over this time frame with notable exceptions for brown shrimp and blue crabs.

The eastern oyster (*Crassostrea virginica*) is the primary oyster species found in the Gulf and is the major commercial species. Oysters are important as both organisms and habitat with an integral role in the functioning of the ecosystem. In the Gulf of Mexico, oysters are distributed throughout the coastal area and are found in higher abundance in near-shore, shallow, semi-enclosed water bodies, close to freshwater sources (OTTF 2012). The majority of oysters are found off of Louisiana, followed by Florida, Texas, and Mississippi. Alabama has the lowest density of oysters in the Gulf of Mexico. Oyster reefs in Alabama are, however, important to the Mobile Bay ecosystem as they remove excess nutrient and suspended particles from the water column.

Numerous fish species occur in the project area with the most common including: Atlantic croaker (*Micropogonias undulatus*), spot (*Leiostomus xanthurus*), bay anchovy (*Anchoa mitchilli*), and Gulf menhaden (*Brevoortia patronus*) (Swingle 1971; Riedel et al. 2010).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to benthos, invertebrates and fish would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Potential adverse effects to benthic organisms, invertebrates, and fish may occur during construction activities due to breakwater placement and noise; however, these effects would be short term, localized, and minor. The project may reduce habitat utilization by species in the area, as most invertebrates and fish would likely avoid the project area during the construction process. There would be no change in the diversity or local populations of marine and estuarine species. Any disturbance would not interfere with key behaviors such feeding and spawning. There would be no restriction of movements daily or seasonally.

Following construction, there is expected to be increased habitat utilization of the breakwaters and near-shore environment by these species and a beneficial, long-term impact is anticipated.

Essential Fish Habitat

Affected Resources

Essential Fish Habitat is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity" (16 U.S.C. § 1802(10)). The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments (see Figure 10-4). These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. EFH components that exist within the project area include emergent wetlands, mud substrate, and estuarine water columns.

The 1996 amendments to the MSFCMA set forth a mandate for NMFS, regional Fishery Management Councils (FMC), and other Federal agencies to identify and protect EFH of economically important marine and estuarine fisheries. To achieve this goal, suitable fishery habitats need to be maintained and restored. A provision of the MSFCMA requires that FMCs identify and protect EFH for every species managed by a Fishery Management Plan (FMP) (U.S.C. 1853(a)(7)). There are FMPs in the Gulf region for shrimp, red drum, reef fishes, coastal migratory pelagics, and highly migratory species (e.g., sharks).

During the process of analyzing, identifying, and describing EFH for each managed species, the Gulf Council refined their designations by establishing five "eco-regions." Within each eco-region, EFH was further defined as occurring either in estuarine (inside barrier islands and estuaries), nearshore (waters less than 18-meters/60-feet deep) or offshore waters (greater than 18-meters/60-feet deep). The

proposed project is within Eco-region 3, which extends from Pensacola Bay, Florida, to the Mississippi River Delta. The restoration activities would be located within estuarine waters of Mississippi Sound.

EFH within estuaries is defined as, "all estuarine waters and substrates (mud, sand, shell, rock and associated biological communities), including the sub-tidal vegetation (grasses and algae) and adjacent inter-tidal vegetation (marshes and mangroves)," (Generic Amendment Number 3 for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico, Gulf of Mexico Fishery Management Council, March 2005). Estuarine habitats such as shallow waters, submerged aquatic vegetation, emergent marshes, mangroves, oyster reefs, and unvegetated soft bottom substrates all provide EFH for multiple fish species managed by the Gulf Council that inhabit the estuary for part of their life cycle. Table 10-2 summarizes EFH categories for estuarine waters within Eco-region 3 within the vicinity of the proposed project.

Figure 10-4. Essential Fish Habitat in the Gulf of Mexico

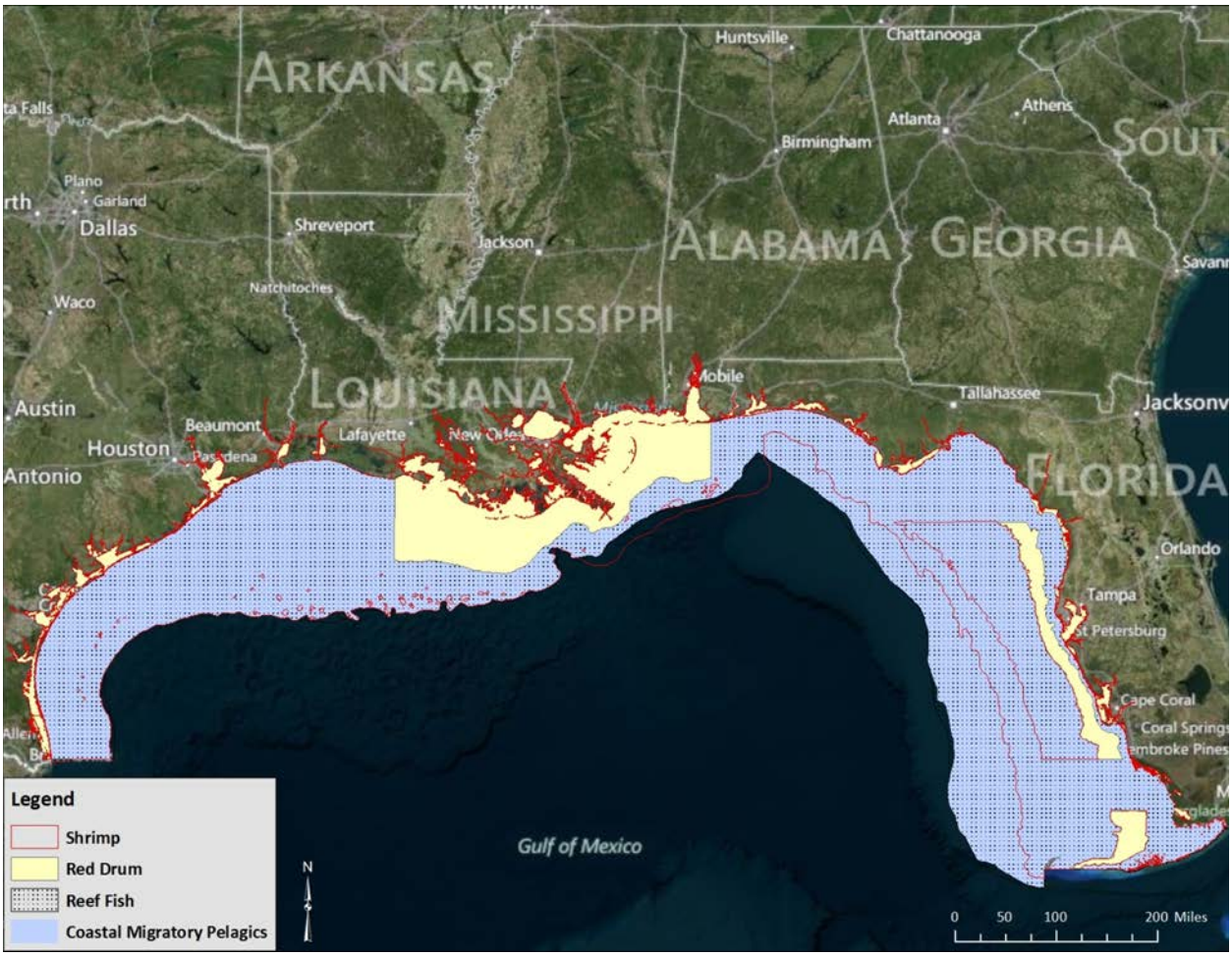


Table 10-2. Estuarine Habitats for Gulf Council Managed Species Within Eco-Region 3 Present Near the Project Site

(● indicates habitat type designated as EFH for species' life stage)

Estuarine Emergent Marsh							
Species Common Name	**Eggs**	**Larvae**	**Post Larvae**	**Early Juvenile**	**Late Juvenile**	**Adult**	**Spawning Adult**
Red Drum			●	●		●	
Gray Snapper						●	
Brown Shrimp				●			
White Shrimp				●			
Estuarine Submerged Aquatic Vegetation							
Species Common Name	**Eggs**	**Larvae**	**Post Larvae**	**Early Juvenile**	**Late Juvenile**	**Adult**	**Spawning Adult**
Red Drum		●	●		●	●	
Lane Snapper			●	●	●		
Brown Shrimp				●			
Pink Shrimp				●			
Estuarine Pelagic							
Species Common Name	**Eggs**	**Larvae**	**Post Larvae**	**Early Juvenile**	**Late Juvenile**	**Adult**	**Spawning Adult**
Spanish Mackerel				●	●	●	
Estuarine Oyster Reef							
Species Common Name	Eggs	Larvae	Post Larvae	Early Juvenile	Late Juvenile	Adult	Spawning Adult
Brown Shrimp				●			
Estuarine Sand and Shell Bottom							
Species Common Name	**Eggs**	**Larvae**	**Post Larvae**	**Early Juvenile**	**Late Juvenile**	**Adult**	**Spawning Adult**
Red Drum			●			●	
Gray Snapper						●	
Lane Snapper				●	●		
Brown Shrimp				●			
Estuarine Mud/Soft Bottom							
Species Common Name	**Eggs**	**Larvae**	**Post Larvae**	**Early Juvenile**	**Late Juvenile**	**Adult**	**Spawning Adult**
Red Drum		●	●	●		●	
Gray Snapper						●	
Lane Snapper				●	●		
Brown Shrimp				●			
White Shrimp				●			

The NMFS manages the highly migratory species (HMS), such as tunas, billfish, and sharks, within EEZ and state territorial waters and provides the EFH designations for HMS. The EFH designations for HMS are primarily based on limited available species distribution data, which led NMFS to identify geographic areas as EFH rather than specific habitat types typically identified in the Gulf Council designations .

HMS managed by NMFS with EFH located within Eco-region 3 in Mississippi Sound within the vicinity of the proposed project are included in Table 10-3 below.

Table 10-3. Highly Migratory Species EFH Designations – State Waters of Eco-Region 3 within the Project Area

Species Common Name	Life Stage Within Estuarine Waters
Hammerhead Shark	Neonate, Juvenile & Adult
Scalloped Hammerhead Shark	Neonate, Juvenile & Adult
Blacktip Shark	Neonate, Juvenile & Adult
Bull Shark	Neonate, Juvenile & Adult
Spinner Shark	Juvenile
Tiger Shark	Juvenile
Bonnethead Shark	Neonate, Juvenile & Adult
Atlantic Sharpnose Shark	Neonate, Juvenile & Adult
Finetooth Shark	Neonate, Juvenile & Adult

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to EFH would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Construction activities and equipment noise associated with construction may temporarily reduce habitat utilization by EFH species in the immediate area. These effects would be short term, localized, and minor. Because the proposed project footprint itself is located in unvegetated open water soft bottom habitat, there would be no adverse impacts to wetlands, seagrasses, or oyster reef habitats. Minor spatially limited adverse effects to EFH would occur within the direct footprint of the breakwater due to the conversion of 0.55 acres of estuarine soft bottom habitat to hard substrate habitat. However, hard substrate habitat and oyster reef habitat created by the breakwater would also directly provide estuarine benthic habitat diversity and EFH benefits to federally managed species such as brown shrimp, red drum, gray and red snapper which utilize shell bottom and oyster reef habitats.

Indirect adverse impacts are not expected in the short or longer term. Once the proposed project is complete, beneficial indirect effects on water quality are expected as a result of increased filtration capacity from the newly established bivalves (Coen et al. 2007). Oysters and other bivalves can also indirectly enhance EFH by offsetting the effects of coastal nutrient loading (Dalrymple 2013), potentially reducing the frequency and magnitude of hypoxia and fish kills. Additionally, oyster and other bivalves have been shown to indirectly promote SAV colonization, which may further enhance EFH, due to sediment stabilization and increased water clarity (Meyer et al. 1997).

ADCNR, in consultation with the contractors, would take all practicable precautions to avoid and minimize negative impacts to EFH. The following BMPs would be implemented specific to minimization of impacts to EFH resources:

BMPs would be implemented during construction to reduce impacts from project implementation. Contractors would access the site with shallow draft vessels during tide levels which are sufficient to avoid prop washing. Contractors would be notified of the location of seagrasses inland of the proposed project footprint and would be instructed not to enter seagrass beds during construction.

- The contractor would follow the USFWS standard manatee construction conditions and standard sea turtle and smalltooth sawfish conditions, as required under Endangered Species Section 7 consultations. The construction procedures outlined in these documents require boats to operate at idle speed and ensure that contractors visually assess the construction area for manatees and sea turtles. Following these guidelines would also help minimize potential prop dredging, and subsequent bottom disturbance, and would help minimize impacts to individual fish species.
- Monitoring would be conducted before, during, and after project implementation to ensure compliance with project design. If immediate post-construction monitoring reveals that unavoidable impacts to EFH have occurred, appropriate coordination with regional EFH personnel would take place to determine appropriate response measures, possibly including mitigation.

Marine Mammals

Affected Resources

Marine mammals found in the Gulf of Mexico include 21 species of cetaceans (whales and dolphins) and the West Indian manatee (*Trichechus manatus*). Three species commonly occur at nearby Gulf Islands National Seashore and Mobile Bay and may therefore occur in the waters surrounding the proposed project area: the bottlenose dolphin (*Tursiops truncates*), the Atlantic spotted dolphin (*Stenella frontalis*) and the West Indian manatee. Manatee will be discussed in the section on threatened and endangered species, below.

Dolphin Species

The bottlenose dolphin and the Atlantic spotted dolphin are the two most common marine mammals found in the Gulf of Mexico. Both species feed primarily on fish, squid and crustaceans. While the Atlantic spotted dolphin spends the majority of its life offshore, the bottlenose dolphin often travels into coastal bays and inlets for feeding and reproduction.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to marine mammals would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Potential short-term minor adverse effects due to noise, prey availability, and turbidity associated with breakwater placement may temporarily disturb certain dolphin species in the vicinity of the project area. However, the mobility of these species reduces the risk of injury due to construction activity. Furthermore, the short duration of construction activities, localized nature of the project and best management practices would prevent take of dolphins.

Terrestrial Species

Vegetation

Affected Resources

The coastal vegetative cover near Point aux Pins consists mainly of emergent herbaceous wetlands (MRLCC 2015). These are areas where perennial herbaceous vegetation accounts for 80 percent of the cover and the soil or substrate is periodically saturated or covered with water. Emergent wetlands include marshes, meadows, and fens.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to vegetation would occur.

Proposed Action

Since construction equipment would be operating and placing WAUs in seawater, no potential adverse effects to terrestrial vegetation are expected.

Birds

Affected Resources

Many species of birds spend all or a portion of their life cycle along the Gulf of Mexico using a variety of habitats at different stages. Major groups of birds that use habitats throughout the northern Gulf of Mexico include: waterfowl and other water-dependent species, pelagic seabirds, raptors, colonial waterbirds, shorebirds, secretive marsh birds, and passerines.

Many bird species migrate between breeding and wintering habitat and, upon reaching the Gulf Coast, migrate east-west along the northern Gulf Coast and/or cross the Gulf of Mexico each fall and spring. Central, Mississippi, and Atlantic Flyways are used by millions of birds that converge on the Gulf Coast where they either migrate along the northern Gulf Coast before reaching their destination on the Gulf of Mexico; follow the Mexico-Texas coastline; or cross the Gulf of Mexico between Mexico's Yucatan Peninsula and the Texas Coast (trans-Gulf migrants) (TPWD 2015). The groups of bird species utilizing habitats within vicinity of Point aux Pins are described below in Table 10-4.

Table 10-4. Groups of bird species utilizing habitats within the vicinity of Point aux Pins

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Waterfowl (geese, swans, ducks, loons, and grebes)	Foraging, feeding, resting, and roosting	Waterfowl forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily roost and nest in low vegetation.
Other water birds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, and roosting	These birds forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily roost outside of the project area.
Raptors (osprey, hawks, eagles, owls)	Foraging, feeding, and resting	Raptors forage, feed, and rest in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. Most raptors are aerial foragers and soar long distances in search of food. The project is expected to improve foraging habitat for raptors.
Colonial Wading birds (herons, egrets, ibises, American flamingo)	Foraging, feeding, and resting	Wading birds primarily forage and feed at the water's edge. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily nest and roost in trees or shrubs (e.g. pines, *Bacchurus* and mangroves), which occur outside the project area. In addition, this project is likely to improve shoreline habitat conditions and near-shore habitat.

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Shorebirds (plovers, oystercatchers, stilts, sandpipers)	Foraging, feeding, resting, and roosting	Shorebirds forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily nest or roost outside the immediate area of disturbance.
Marsh birds (passerine species; grebes, bitterns, rails, gallinules, and limpkin)	Foraging, feeding, resting, and roosting	Marsh birds forage, feed, rest, and roost in the vicinity of the project area. As such, they may be impacted locally and temporarily by the project. However, it is expected that they would be able to move to another nearby location to continue foraging, feeding and resting if disturbed by the project.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 U.S.C. §§ 703 et seq.) makes it "unlawful at any time, by any means or in any manner, to […] take, capture, kill, attempt to take, capture, or kill, possess, […] ship, […] transport or cause to be transported […] any migratory bird, any part, nest, or egg of any such bird." The MBTA applies to migratory bird species that occur in the United States as the result of natural biological or ecological processes. Over 800 species of birds occurring in the United States are protected under the MBTA.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to birds would occur.

Proposed Action

The MBTA requires the protection of all migratory bird species and protection of ecosystems of special importance to migratory birds against detrimental alteration, pollution, and other environmental degradation.

The project would have a minor, short term impact to birds during construction due to elevated noise levels and presence and operation of equipment. Given the small project footprint and the species' mobility, any species foraging within the project area during construction would be able to avoid direct impacts. Potential effects to prey resources may occur during construction; however, these would be minor and temporary.

The proposed action would result in minor, short-term, localized adverse impacts to transient bird individuals during construction, but these species are mobile and would likely exit the area during construction (no impacts to overall population). If nesting birds are observed during project construction, the USFWS would be contacted to determine if BMPs are necessary to avoid take. The Trustee would implement any BMPs such that the proposed action would not result in take under the MBTA. The proposed action would have a long-term minor beneficial impact due to increasing habitat

for juvenile finfish and shellfish as a source of food for shorebirds and wading birds. The proposed action would not result in indirect impacts to birds.

Mammals

Affected Resources

North American River Otter

The North American river otter (*Lontra canadensis*) is a member of the weasel family. River otters are found in a variety of freshwater habitats including rivers, streams and marshes. Their home ranges can be as small as 5 miles and as large as 40 since they are able to travel over land to reach water sources. They typically feed on a variety of fish, freshwater mussels, crayfish, frogs, snakes, and turtles. North American river otters build dens in the burrows of other mammals, in natural hollows, such as under a log, or in riverbanks. Dens have underwater entrances and a tunnel leading to a nest chamber that is lined with leaves, grass, moss, bark, and hair (NatureServe 2015).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to mammals would occur.

Proposed Action

Potential adverse effects from noise and other activity associated with construction could temporarily disturb river otters; however, it is unlikely that this species would be present in the construction area as it is saltwater. River otters would more likely be found in Little River and Bayou la Batre; therefore, impacts to river otters are not anticipated.

Reptiles

Affected Resources

Diamondback Terrapins

Diamondback terrapins (*Malaclemys terrapin*) are believed to be the only turtle in the world that lives exclusively in brackish water habitats (e.g., tidal marshes, estuaries, and lagoons). The species primarily forages on fish, invertebrates (e.g. snails, worms, clams, crabs), and marsh grass. Nesting for the species occurs in sandy beach and/or shell habitats. Terrapin hatchlings emerge from August to October. Only 1 to 3 percent of the eggs laid produce a hatchling, and the number of hatchlings that survive to adulthood is believed to be similarly low (Defenders of Wildlife 2011). Most terrapins hibernate during the winter by burrowing into the mud of marshes. Decreases in terrapin populations have been documented throughout their range due to interactions with commercial crab/lobster industries, coastal development and incidental injury from motorboats (ADCNR 2010). It is for these reasons that

diamondback terrapins have received “species of special concern” status in many states including Alabama.

American alligators

American alligators (*Alligator mississippiensis*) are an important part of the environment; not only do they control populations of prey species, they also create peat and “alligator holes,” which are invaluable to other species (Britton 1999). Alligators are known to dig holes in mud where water fluctuates to provide protection from heat. These animals are carnivores that feed on anything; they eat fish, snails, birds, frogs, turtles, and mammals near the water’s edge (Schechter and Street 2000). Although they are primarily freshwater animals, alligators will also venture into brackish salt water (Savannah River Ecology Laboratory 2012). Their populations have increased as a result of strict conservation measures, but alligator habitat is still being destroyed. Alligators are good indicators of environmental factors, such as toxin levels − increased levels of mercury have been found in alligator blood samples (Britton 1999). The first few years of an alligator hatchling’s life are the most dangerous, as they are preyed upon by snakes, wading birds, osprey, raccoons, otters, large bass, and garfish (Schechter and Street 2000). Alligators are hunted for their skin, which is commercially used for wallets, purses, boots, and other consumer goods (Schechter and Street 2000). Alligators are also raised in captivity for the production of their meat and skin, resulting in a multimillion dollar industry (Schechter and Street 2000). In addition, alligators are a tourist attraction, especially in Florida (Schechter and Street 2000).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to reptiles would occur.

Proposed Action

Potential minor adverse effects due to noise and other activity associated with breakwater placement may temporarily disturb diamondback terrapin and alligators that are in the project area. Construction activities may also temporarily increase the potential for boat collisions with these species; however, contractors would operate their vessels at idle/no wake speed during construction activities as required by the Marine Mammal Protection Act. The mobility of both the alligator and diamondback terrapin reduces the risk of injury due to construction activity. Furthermore, the short duration of construction activities and localized nature of the project would aid in preventing incidental take of reptiles.

Threatened and Endangered Species

Birds

Affected Resources

Three Federally listed bird species, wood stork (*Mycteria americana*), piping plover (*Charadrius melodus*), and red knot (*Calidris canutus rufa*) could occur in Mobile County, Alabama.

The wood stork (*Mycteria americana*) is a threatened species originally listed by USFWS in 1984. The wood stork is the largest wading bird breeding in the United States and is typically associated with freshwater habitats and prefers swamps, coastal shallows, ponds, and flooded pastures (Stokes 1996). During times of drought, depressions in brackish marshes become important habitat components. Wood storks are residents of the Southeast specifically along the Gulf Coast from Texas to Florida. This species does not have a breeding population within the state of Alabama (USFWS 2007), but non-breeding transient individuals may be present in summer and early fall in the western Inland Coastal Plain near the Tombigbee River, lakes in Hale, Marengo, and Perry Counties, and at ponds near Montgomery. The Point aux Pins Living Shoreline project would not impact any habitat typically used by the wood stork Wood Storks are not known to forage in the project area and there are no known wood stork breeding colonies or roost sites within close proximity of the project area. The piping plover is a small North American shorebird with three distinct populations that breeds in the Great Lakes, the Northern Great Plains and the Atlantic Coast. The Atlantic Coast population breeds from North Carolina to Newfoundland and winters in the Caribbean and along the Atlantic and Gulf Coasts. Piping plovers typically utilize sand beaches, mixed sand and gravel beaches and exposed sandy tidal flats. In Alabama, critical habitat for piping plovers is largely limited to the Gulf barrier islands. Piping plover has designated critical habitat near the project area at Isle aux Herbes (unit AL-1) and Dauphin Island (unit AL-2). Unit AL-1 is at least 2 miles from any project activity and Unit AL-2 is at least 6 miles from any project activity.

The PCEs for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support these habitat components. The PCEs are found in geologically dynamic coastal areas that support intertidal beaches and flats (between annual low tide and annual high tide) and associated dune systems and flats above annual high tide. Additional information on each specific unit included in the designation can be found at 66 FR 36038. PCEs of wintering piping plover critical habitat include:

1) Intertidal flats with sand or mud flats (or both) with no or sparse emergent vegetation.

2) Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers. Such sites may have debris, detritus, or microtopographic relief (less than 50 cm above substrate surface) offering refuge from high winds and cold weather.

3) Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas.

4) Washover areas are broad, unvegetated zones, with little or no topographic relief, that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action.

Activities that affect PCEs include those that directly or indirectly alter, modify, or destroy the processes that are associated with the formation and movement of barrier islands, inlets, and other coastal landforms. Those processes include erosion, accretion, succession, and sea-level change. The integrity of the habitat components also depends upon daily tidal events and regular sediment transport processes, as well as episodic, high-magnitude storm events (Service 2001b).

Between 1981 and 2014, piping plover sightings in Mobile and Baldwin counties indicate that there is an average high count of approximately 8 individuals occurring in March and an average low count of less than 1 individual occurring in June (eBird 2015).

The red knot is the largest of the stints in North America. It is a medium-sized, bulky bird with a short, straight, black bill. The red knot makes one of the longest yearly migrations of any bird, as breeding occurs in the high Arctic and most wintering occurs in South America. In Alabama, the red knot is rare as it migrates through the area between its breeding and wintering habitats. Red knots can winter along the Gulf coast and, when present, they are typically found in mudflats and along sandy shores.

Bald and Golden Eagle Protection Act

The bald eagle is protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles occur most commonly in areas close to coastal areas, bays, rivers, lakes, or other bodies of water that provide concentrations of food sources, including fish, waterfowl, and wading birds. Usually, the bald eagle nests in tall trees (mostly live pines) that provide clear views of surrounding area. In the Southeast, bald eagles typically nest between September and May.

Suitable habitat for the bald eagle is likely present between the shoreline and the proposed project site. However, occurrences of bald eagles in Mobile County are very low. In the last fifty years, bald eagle counts have averaged between zero and two individuals annually (ebird 2015).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to threatened birds would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Potential adverse effects to threatened birds include elevated noise levels and the presence of breakwater construction equipment. These species are mobile and would likely exit the area during construction (no impacts to overall population). Therefore, adverse effects would be short term, localized, and minor.

Piping plover and red knot may use nearby shoreline habitats for resting or foraging during winter months. Potential impacts to these species could include elevated noise levels during project construction. However, this project would take place at least 100 yards seaward of adjacent shorelines. Additionally, construction of the project would most likely take place during summer in order to take advantage of high tides during daylight hours. Therefore any impacts to piping plovers and red knot are unlikely and/or would be short-term, localized, and minor.

The designated critical habitat for piping plover is located at Isle aux Herbes (Unit AL-1). Additional designated critical habitat is located on Dauphin Island (Unit AL-2). Unit AL-1 is at least 2 miles from any project activity and Unit AL-2 is at least 6 miles from any project activity. Construction barges, tugs and other watercraft would most likely be staged in either Bayou la Batre and/or Coden, and associated watercraft would have no reason to come within close proximity to either Unit. Additionally, given these distances combined with prevailing winds and currents, the presence of the living shorelines breakwaters would have no impact on these designated critical habitats.

Wood Storks are not known to forage in the project area and there are no known wood stork breeding colonies or roost sites within close proximity of the project area. Therefore no effect on this species is expected.

For water based construction activities that are intended to protect the shoreline, best practices include:

- Conducting construction activities outside of nesting season, if nests are present; if a nest is present and it is not possible to avoid construction, maintain a buffer of at least 660 feet from the nest; and,
- Minimize the number of boat trips passing within 660 feet of the nest location.

There are no apparent suitable sites for bald eagle nests within 1,000 feet of the project area and no eagle nests have been documented on Point aux Pins. If bald eagle nests are located during pre-construction site assessments, best management practices under the Bald and Golden Eagle Protection Act would be followed to minimize harm to bald eagles.

Fish

Affected Resources

Gulf Sturgeon

The NMFS and USFWS listed the Gulf sturgeon (*Acipenser oxyrinchus desotoi)* as a threatened species on September 30, 1991. Adults are 180 to 240 cm (71-95 inches) in length, with adult females larger than

adult males. Adult fish are bottom feeders, eating primarily invertebrates, including brachiopods, insect larvae, mollusks, worms and crustaceans. The Gulf sturgeon is an anadromous fish that migrates from salt water into coastal rivers during the warmer months to spawn. The sturgeon often stays in the Gulf of Mexico and its estuaries and bays in cooler months (NMFS 2013a). Most adult feeding takes place in the Gulf of Mexico and its estuaries. The fish return to breed in the river system in which they hatched. Spawning occurs in areas of deeper water with clean (rock and rubble) bottoms. The eggs are sticky and adhere in clumps to snags, outcroppings, or other clean surfaces. Sexual maturity is reached between the ages of 8 and 12 years for females and 7 and 10 years for males. The Gulf sturgeon historically was threatened because of overfishing and then by habitat loss due to construction of water control structures, dredging, groundwater extraction, and flow alterations.

Gulf Sturgeon critical habitat in Mississippi Sound is designated west of Point aux Pins. Therefore, the project area is not designated as Gulf sturgeon critical habitat; however, USFWS includes the Gulf sturgeon on the list of species likely to occur in Mobile County, Alabama. Sturgeon have been observed, collected, and tagged in the Mobile Bay. Sturgeons were observed using the marine and estuarine waters of the bay, but were not observed moving through the bay toward the Mobile River or spawning. The tagged sturgeon from Mobile Bay returned to the Choctawhatchee River in Florida (Mettee et al. 2009; NMFS 2013a).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to threatened and endangered fish would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Potential adverse effects to the Gulf sturgeon include elevated noise levels and the presence of breakwater construction equipment. Noise associated with the project would be limited to mainly engine noise from small shallow draft tug boat and a small barge-based track hoe used to place the WAUs as well as small watercraft used to conduct site visits and transport personnel. Turbidity from vessel operations and WAU placement would be minimal and short-term. To reduce these impacts, WAU placements would take place at high tide as much as possible to avoid propeller contact with the bottom. All work would take place in less than 5 feet of water in areas of silty sand to stiff clay waterbottoms. These shallow waterbottoms are not known to be favored Gulf Sturgeon foraging areas. Additionally, work would most likely take place during the spring and summer months when Gulf Sturgeon are not likely to be present in inshore shallow waters. If present, these species are mobile and would likely exit the area during construction (no impacts to overall population). Some bottom habitat would be converted to hard bottom. The use of breakwaters as a living shoreline technique may provide an indirect benefit to Gulf sturgeon by enhancing the diversity of prey available by creating patchwork reefs that, over time, provide more structurally complex habitat for prey species. Throughout

the duration of the project, the breakwaters would help mitigate coastal erosion and also encourages nektonic production that could lead to greater prey availability in the immediate project area for Gulf sturgeon.

The proposed project would not take place within Gulf Sturgeon critical habitat. Gulf sturgeon critical habitat is located nearby, but just west of the project area. The eastern boundary of unit 8, which includes a portion of Mississippi Sound, is -88.313333°W and does not include the eastern side of Point Aux Pins where the project would be located. Construction barges, tugs and other watercraft would most likely be staged in either Bayou la Batre and/or Coden, and associated watercraft would have no reason to enter Gulf Sturgeon critical habitat. Therefore, no impact to Gulf Sturgeon estuarine critical habitat is anticipated.

Mammals

Affected Resources

The West Indian Manatee

The West Indian manatee (*Trichechus manatus*) is listed as endangered under the ESA. The species is endangered due to its small population size (less than 2,500 mature individuals with possible population decline), the possibility of at least a 50 percent future reduction in population size, and near- and long-term threats from human-related activities (USFWS 2010; FFWC 2007). Between October and April, manatees concentrate in areas of warmer water. During summer months, the species may migrate as far west as the Louisiana and Texas coast on the Gulf of Mexico. In Alabama, a number of manatees (one to fifteen individuals) are routinely seen in the calm, shallow waters of rivers and sub-embayments of Mobile Bay and the Mobile-Tensaw Delta. Manatees inhabit both salt and fresh water of sufficient depth (about 5 feet to usually less than 18 feet). Manatees will consume any aquatic vegetation available to them including sometimes grazing on the shoreline vegetation.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to threatened and endangered mammals would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Potential minor adverse effects due to noise and turbidity associated with breakwater construction may temporarily disturb manatees in the vicinity of the project area. However, the mobility of this species reduces the risk of injury from construction activity. Furthermore, the short duration of construction activities and localized nature of the project would aid in minimizing impacts. All construction activities

would follow the Standard Manatee Conditions for In-Water Work (USFWS 2011) to minimize impacts to West Indian manatees to an insignificant and discountable level.

Because of manatee sightings in Mobile Bay and its tributaries in recent years, extreme care would be taken during construction not to disturb manatees.

Best management practices which would be implemented in accordance with the Standard Manatee Conditions for In-Water Work (USFWS 2011) are as follows:

- All vessels associated with the construction project would operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom.
- All vessels would follow routes of deep water whenever possible. Siltation or turbidity barriers would be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment.
- Barriers would not impede manatee movement.
- All in-water operations, including vessels, would be shut down if a manatee(s) comes within 50 feet of the operation.
- Activities would not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation.
- Temporary signs concerning manatees would be posted prior to and during all in-water project activities.

Reptiles

Affected Resources

Snakes

The black pine snake (*Pituophis melanoleucus lodingi*) is a large (48 to 64 inches long) stocky snake and is only proposed for threatened status by the US Fish and Wildlife Service. Its back and belly are uniformly black or dark brown. Faint blotches may be seen on the hindbody or tail (USFWS 2015). The snake has a range that extends from southwestern Alabama, through southern Mississippi, and into southeastern Louisiana. In each of these states it is considered imperiled or critically imperiled, and the U.S. Fish and Wildlife Service proposed the snake for federal listing under the Endangered Species Act on October 10, 2014. The snake is known to occur in Mobile County, largely in upland, open longleaf pine forests with dense herbaceous groundcover (USFWS 2015). The distribution of remaining populations has become highly restricted due to the destruction and fragmentation of the longleaf pine habitat, which has become one the most critically endangered ecosystems in the United States (USFWS 2013). In Alabama, populations occurring on properties managed as gopher tortoise habitat are likely the best opportunities for long-term survival of the black pine snake (USFWS 2013).

The eastern indigo snake (*Drymarchon corais couperi*) is a large (60 to 74 inches) snake with a black and iridescent blue body (USFWS 2015). The chin and throat are reddish or white, and the color may extend down the body (USFWS 2015). The belly is cloudy orange and blue-gray (USFWS 2015). Historically, the eastern indigo snake lived throughout Florida, the coastal plain of southern Georgia, extreme south Alabama, and extreme southeast Mississippi (USFWS 2015). Today the indigo snake survives in Florida and southeast Georgia, and has been extirpated from Alabama and Mississippi (USFWS 2015); therefore, it is extremely unlikely to exist in the project area. The Indigo Snake is often dependent upon the deep burrows dug by the gopher tortoise and uses them as a refuge from extreme temperatures (ADCNR 2015). This restricted habitat is even more isolated by the snake's preference for the interspersion of wet lowlands like cypress ponds (ADCNR 2015). These preferred areas are usually found where rivers and creeks run thru sand hills habitat (ADCNR 2015).

Turtles and Tortoises

There are five species of sea turtles that are found in the Gulf of Mexico: green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), loggerhead sea turtle (*Caretta caretta*), Kemp's Ridley sea turtle (*Lepidochelys kempii*), and leatherback sea turtle (*Dermochelys coriacea*). All five species are listed under the ESA. The Gulf populations of hawksbill, Kemp's Ridley, and leatherback sea turtles are listed as endangered. Loggerhead (northwest Atlantic distinct population segment) and green (except the Florida breeding population) sea turtles are listed as threatened. In Mobile County, there is also one endangered freshwater turtle, the Alabama red-bellied turtle (*Pseudemys alabamensis*), and one threatened tortoise, the Gopher tortoise (*Gopherus polyphemus*).

Sea turtles in the Gulf (with the exception of the leatherback turtle) have a life history cycle where hatchlings develop in open ocean areas (e.g., continental shelf) and juvenile and adult turtles move landward and inhabit coastal areas. Leatherback turtles spend both the developmental and adult life stages in the open oceanic areas of the Gulf of Mexico (Dow Piniak 2012). Sea turtles nest on low and high energy ocean beaches and on sandy beaches in some estuarine areas. Immediately after hatchlings emerge from the nest, they begin a period of frenzied activity. During this active period, hatchlings move from their nest to the surf, swim, and are swept through the surf zone, and continue swimming away from land for up to several days (NMFS 2013b). Once hatchling turtles reach the juvenile stage, they move to nearshore coastal areas to forage. As adults, they utilize many of the same nearshore habitats as during the juvenile developmental stage. Sea turtles utilize resources in coral reefs, shallow water habitat (including areas of seagrasses), and areas with rocky bottoms.

Sea turtles maintain a variety of Gulf habitats including SAV beds and coral reefs. Grazing on SAV by turtles helps to increase nutrient cycling in those habitats and prevents an over-accumulation of decaying SAV on the seafloor (Thayer et al. 1984). In addition to maintaining habitats, sea turtles also aid in balancing the food web in their marine environments. Leatherbacks, for example, prey primarily upon jellyfish and help to prevent the proliferation of this group that can easily outcompete fish species in the same area (Lynam et al. 2006).

The Alabama red-bellied turtle is typically found in shallow vegetated backwaters of freshwater streams, rivers, bays, and bayous in or adjacent to Mobile Bay. They prefer habitats having soft bottoms and extensive beds of submergent aquatic macrophytes (aquatic plants that grow in or near water).

The gopher tortoise usually lives in relatively well-drained, sandy soils generally associated with longleaf pine and dry oak sandhills. They also live in scrub, dry hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, mixed hardwood-pine communities, and a variety of habitats that have been disturbed or altered by man, such as power line rights-of-way, and along roadsides.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to threatened and endangered reptiles would occur. .

Proposed Action

Potential adverse effects on sea turtles include noise and the presence of construction equipment. However, these impacts are expected to be short-term, localized, and minor. Due to the species' mobility and the implementation of NMFS's Sea Turtle and Small-tooth Sawfish Construction Conditions, the risk of injury from construction would be negligible. Best management practices which would be implemented in accordance with the he National Marine Fisheries Service's Sea Turtle and Small-tooth Sawfish Construction Conditions (NMFS 2006) to minimize adverse impacts to sea turtles are as follows:

- All vessels associated with the construction project would operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom.
- All project work would be in-water and no sea turtle nesting habitat exists in the project area.
- All construction personnel would be trained on what they are to do if the presence of a sea turtle is detected.
- All construction personnel would be notified of the potential presence of sea turtles in the water and would be reminded of the need to avoid sea turtles. If any sea turtles are found to be present in the immediate project area during activities, construction would be halted until species moves away from project area.
- Construction activities would occur during daylight hours to the maximum extent possible and noise would be kept to the minimum feasible.
- All construction personnel would be notified of the criminal and civil penalties associated with harassing, injuring, or killing sea turtles.

Sea turtle entrapments is a concern with certain types of WAUs and/or similarly shaped artificial reefs, especially large units placed on sandy sediments in high current areas. The waterbottoms at the Point aux Pins project site consist stiff clay to silty sandy sediments. As such the WAUs will most likely settle 6-8" into the sediments. This settlement, which is taken into account during engineering and design,

would prevent sea turtles from entering the WAUs from gaps between the waterbottoms and the bottom of the WAU. Additionally, the WAU's themselves, including the holes in the proposed WAUs, are smaller than the offshore units where sea turtle entrapment has been observed. The size of the WAUs and the size of the holes in the WAUs to be used at Point aux Pins would prevent adult sea turtles from entering the units. Finally, the proposed project site is located in brackish, relatively turbid waters, where sea turtles rarely are known to forage. Based on these factors, sea turtle entrapment is the risk of sea turtle entrapment is very low.

Since the Alabama red-bellied turtle rarely occurs in saltwater, and considering most of the populations occur in the backwaters of upper Mobile Bay, no impacts are expected.

Since construction equipment would be operating and placing WAUs in seawater, no potential adverse effects to the gopher tortoise, Eastern indigo snake, or black pine snake are expected.

Summary of Impacts to the Biological Environment

Impacts to the biological environment from implementation of the Point aux Pins Living Shoreline Project would include:

- SAV: No short- or long-term adverse effects to SAV are expected. Long-term benefits would occur to the near-shore water column (quality and movement) which may create a more suitable environment for SAV establishment.
- Benthos, invertebrates and fish: Potential short-term minor adverse effects to benthic organisms, invertebrates, and fish may occur during construction activities due to breakwater placement and noise. Following construction, there is expected to be increased habitat utilization of the breakwaters and near-shore environment by these species and a beneficial, long-term impact is anticipated.
- EFH: Potential short-term minor adverse effects to EFH components such as soft bottom substrates are expected. Construction activities and equipment noise associated with construction may reduce habitat utilization by EFH species in the area. Long-term benefits to EFH, especially for shrimp, red drum, juvenile coastal pelagics, and reef fish include increased foraging habitat, increased cover for juveniles, improved water quality, and the potential for conditions favorable to submerged aquatic vegetation colonization (due to decreased wave energy and turbidity).
- Marine mammals: Short-term minor impacts due to noise, prey availability, and turbidity associated with breakwater placement may temporarily disturb certain dolphin species or manatees in the vicinity of the project area. The short duration of construction activities, localized nature of the project, and BMPs would avoid take of marine mammals.
- Terrestrial species: No impacts to terrestrial vegetation or mammals would occur. Potential short-term minor impacts could occur to birds and reptiles from elevated noise levels during construction. There are no apparent suitable sites for bald eagle nests within 1,000’ of the project area and no eagle nests have been documented on Point aux Pins.

Potential impacts to threatened and endangered species are presented below in Table 10-5. Coordination and informal consultation under the Endangered Species Act, Migratory Bird Treaty Act, and Bald and Golden Eagle Protection Act has been completed. Because of nearby suitable habitat and the ability to properly implement conservation measures, the Trustees have determined the proposed project may affect, but will not likely adversely affect the Gulf sturgeon, West Indian manatee, loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, leatherback sea turtle, and hawksbill sea turtle. Accordingly, the Trustees have made a "Not Likely to Adversely Affect" determination under the ESA for those species. For species under their jurisdiction, (see Table 10-5) the USFWS concurred that no threatened, endangered or candidate species or critical habitat or other protected species would be adversely affected as a result of implementing the proposed project. In June 2015, the Trustees requested concurrence from the USFWS regarding these determinations (DOI 2015). The U.S. Fish and Wildlife Service provided concurrence with this determination on July 9, 2015 (USFWS 2015). For species under the jurisdiction of NMFS, consultation was initiated in May 2015 and is not yet complete.

Table 10-5. Threatened and Endangered Species Potentially Affected by the Proposed Project

Common Name	Scientific Name	Federal Status	Trustees' Affect Determination
Gulf sturgeon	Acipenser oxyrinchus desotoi	Threatened	Not Likely to Adversely Affect
West Indian manatee	Trichechus manatus	Endangered	Not Likely to Adversely Affect
Loggerhead sea turtle	*Caretta caretta*	Threatened	Not Likely to Adversely Affect
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	Not Likely to Adversely Affect
Green sea turtle	*Chelonia mydas (P)*	Threatened	Not Likely to Adversely Affect
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	Not Likely to Adversely Affect
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	Not Likely to Adversely Affect
Gopher tortoise	*Gopherus polyphemus*	Threatened (Mobile County)/Candidate Species (Baldwin County)	No Effect
Alabama red-belly turtle	Pseudemys alabamensis	Endangered	No Effect
Black pine snake	*Pituophis melanoleucus lodingi*	Proposed Threatened	No Effect
Eastern indigo snake	*Drymarchon corais couperi*	Threatened	No Effect
Piping plover	*Charadrius melodus*	Threatened	Not Likely to Adversely Affect
Red knot	*Calidris canutus rufa*	Threatened	Not Likely to Adversely Affect

Common Name	Scientific Name	Federal Status	Trustees' Affect Determination
Wood stork	*Mycteria americana*	Threatened	No Effect

10.2.5.3 Human Uses

Cultural Resources

Affected Resources

The Point aux Pins project is currently being reviewed under NHPA Section 106 to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. The Section 106 review process is ongoing and management of Section 106 compliance is being led by the Department of the Interior. A list of properties in the Alabama Register of Historic Places, from Mobile County was consulted. There were no properties found at the location of the project area (AHC 2013a). A list of Alabama properties in the National Register of Historic Places from Mobile County was referenced and there were no properties found at the location of the project area (AHC 2013b).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to cultural resources would occur.

Proposed Action

A complete review of this project under Section 106 is ongoing. That review would be completed prior to undertaking any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse effects on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

Land and Marine Management

Affected Resources

Land Use

The land in the general area is a mix of public and private ownership. As for private ownership, there are homes, subdivisions, agricultural fields and office buildings in nearby towns; however, the land closest to the project area is owned by the Alabama Forever Wild Land Trust, managed by the ADCNR and is not developed.

Coastal Zone Consistency

The project is located in a coastal area that may be regulated by the federal CZMA of 1972, which is implemented through the Alabama Coastal Area Management Program (ACAMP). The CZMA defines coastal zones wherein development must be managed to protect areas of natural resources unique to coastal regions. In addition, the CZMA requires federal actions to be consistent with a state's federally approved coastal management program where those activities would affect a coastal use or resource of the state. The Federal Trustees' consistency determination for this project was submitted to the Alabama Department of Environmental Management (ADEM) on May 21, 2015. Via letter dated June 24, 2015, ADEM concurred with that determination of consistency with the enforceable policies of the Alabama Coastal Area Management Program for these proposed activities. . The project remains subject to further review for consistency during permitting processes to be completed prior to project implementation.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to land and marine management would occur. Beneficial impacts for land management from the protection of the breakwaters would not be realized.

Proposed Action

Sections 6.4.4 and 6.7.10.1 of the Final Phase III ERP/PEIS describe the impacts to land and marine management from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that project types related to restoration activities would have no impact to land and marine management, since projects would generally be consistent with the prevailing management plans and direction governing the use of the land and marine areas where the projects would take place. Some short-term minor to moderate adverse impacts could occur if these activities require temporary closure of areas that are managed for fishing or recreational use. In the long-term, because projects aimed at habitat restoration and conservation of living resources would align with and further the management goals of marine protected areas, these projects are expected to have beneficial impacts on marine management. For this project, impacts to land and marine management were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

This project is located in the State of Alabama's designated coastal zone. As there are reasonably foreseeable effects to state coastal uses or resources associated with its implementation, the project must be consistent with the CZMA and the ACAMP. ADEM would review the project for consistency with the ACAMP. The Federal Trustees' consistency determination for this project was submitted to ADEM on May 21, 2015. Via letter dated June 24, 2015, ADEM concurred with that determination of consistency with the enforceable policies of the Alabama Coastal Area Management Program for these proposed activities. Additional consistency review may be required pursuant to federal regulations (see

15 C.F.R. Part 930) prior to project implementation. This process is typically completed during the USACE CWA Section 404 permitting process and the ADCNR – State Lands Division permitting process.
The proposed action would be constructed consistent with the CZMA and the ACAMP and would not result in adverse short or long-term impacts to land and marine management within the project area. There would be a potential long-term beneficial impact to adjacent public lands by reducing shoreline erosion landward of the reef structure.

Potential mitigation measures for impacts to land and marine management are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would be implemented for this action would include:

- Construction workers and volunteers employed in the projects associated with restoration techniques would be adequately trained to ensure that impacts are minimized.

Aesthetics and Visual Resources

Affected Resources

The shoreline landward of the proposed action area is undeveloped, public land. There is currently no view of the project area from the shoreline as the project would be sited adjacent to wetlands with little or no access from adjacent uplands. Portersville Bay is used for water-based recreation, fishing, agriculture, propagation of fish and wildlife, and shell-fishing (USEPA 2012). Visual receptors of the shoreline include recreational and commercial boaters. The current view from the water to the shoreline is unobstructed.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to aesthetic and visual resources would occur.

Proposed Action

Sections 6.4.8 and 6.7.10.1 of the Final Phase III ERP/PEIS describe the impacts to aesthetics and visual resources from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that project types involving the use of construction equipment, including equipment used for the movement and placement of materials (i.e. barges) and barriers enacted to protect public safety would result in some minor to moderate short-term adverse impacts on aesthetics and visual quality. During the construction period, visible impedances would detract from the natural landscape and create visual contrast for observers visiting the project areas. The severity of impacts would depend to a large degree on the location of the proposed projects, the degree to which these activities would be visible, the duration of the construction activities and how commonplace these activities and equipment are in certain areas. Impacts would likely be greatest in areas frequented by large groups of visitors and in areas where more natural viewsheds exist (i.e. barrier islands). For projects resulting in the long-term placement of structures and signage, long-term minor adverse impacts to aesthetics would occur,

though these types of objects are often commonplace and would become less intrusive over time. For this project, impacts to aesthetics and visual resources were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

As a result of this project, new navigational signs would be installed along the breakwaters to warn marine traffic of the potential underwater obstruction. The signs would not dominate the view or detract from the current user activities or experiences; however, the intent of the signage is to attract attention in order to inform the public for their safety.

The proposed action would result in minor, short term visual impacts while construction equipment is used at the project site. The placement of navigational signs would result in a direct, long term, minor adverse impact on the aesthetics and visual resources of the area and these signs would become less intrusive over time.

Potential mitigation measures for impacts to aesthetic and visual resources are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would be implemented as part of this action include:

- Employment of standard BMPs for construction to reduce erosion.

Tourism and Recreation

Affected Resources

The affected resources include the waters and estuaries along the Point aux Pins shoreline, which is primarily in public ownership. These resources are used by the public primarily for recreational boating, fishing, and bird watching. There is a boat launch east of the project at the mouth of Bayou la Batre. The Grand Bay NWR is located west of the project site; however, no impacts to the NWR would be anticipated from project construction. The adjacent wetlands and uplands are owned by the Alabama Forever Wild Land Trust as a nature preserve and community hunting area. However, no impacts to Forever Wild lands are anticipated and a net benefit would be realized through the reduction of shoreline erosion.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to tourism and recreation would occur.

Proposed Action

Sections 6.4.5 and 6.7.11.1 of the Final Phase III ERP/PEIS describe the impacts to tourism and recreation from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that project types involving ground or substrate disturbing construction activities as well as restoration activities could result in some short-term minor to moderate adverse impacts to wildlife

viewing, short-term minor to moderate adverse impacts to hunting, beach and waterfront visitors, and tourism, and short-term minor to moderate adverse impacts to fishing. Long-term benefits would occur from the improvement of wildlife and aquatic species habitat and associated increases in wildlife and aquatic species populations, diversity and viewing opportunities. For this project, impacts to tourism and recreation were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

During construction of the breakwaters, there would be short-term, minor adverse impacts to public access and use of open water areas for boat traffic; access would be restricted due to safety concerns. Following construction, there would be minor adverse impacts to public access and recreation since the reefs could prevent free-flowing transit between the reef and the shoreline. To avoid navigational disturbances, permanent navigation markers or signage would be installed to assure safe navigation for marine traffic.

The proposed action would have a short term, adverse impact to recreational use of the area during construction since the area would be avoided by recreational boaters. The action would result in a beneficial impact due to increased use of created reef for fishing due to the expected use of the reef by recreationally important fish such as speckled trout and red drum. The project would result in a long-term, minor adverse impact due to the placement of new navigational signs where none currently exist. The project would not result in adverse long term indirect impacts to recreational use. Long-term indirect benefits would occur from the potential for increased use of the area for reef fishing.

Potential mitigation measures for impacts to tourism and recreational use are found in Appendix 6A of the Final Phase III ERP/PEIS. Any of these measures that would apply to the Point aux Pins Living Shoreline project may be used to minimize adverse impacts.

Public Safety and Shoreline Protection

Affected Resources

The proposed breakwaters would be sited near Alabama shorelines. Shorelines are fringe areas along the edge of a waterbody, which connect the shallow aquatic portion of the waterbody with adjacent upland (NYSDEC 2015). These riparian areas provide important environmental functions, such as regulating water quality—including temperature, clarity, nutrients, and contaminants—and sustaining critical habitat for a variety of aquatic and terrestrial organisms (e.g. invertebrates, fish, amphibians, reptiles, shorebirds, waterfowl, and mammals) (NYSDEC 2015). Shoreline erosion, or the loss of sediment from a beach, can be induced by storms, floods, and man-made structures. Many of these events or structures alter the movement and accumulation of sediment along the coast. Techniques that prevent shoreline erosion, such as those presented in this assessment, help limit the removal of sediment in coastal areas.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Point aux Pins and no impacts to public safety or shoreline protection would occur.

Proposed Action

Any disturbances from this project would occur in Portersville Bay, with limited potential for the public to encounter hazardous material. No chemical waste would be created during construction. Any hazardous material from machinery would be contained through appropriate barriers to prevent potential spills and leaks. Because health and safety measures would be followed during construction, adverse impacts are not anticipated. The proposed breakwaters are expected to provide beneficial impacts and counteract erosion by moderating the gradient in the transport of sediment along the shore.

Summary of Impacts to Human Uses

Impacts to human uses from implementation of the Point aux Pins Living Shoreline Project would include:

- Cultural Resources: A complete review of this project under Section 106 is ongoing. That review would be completed prior to undertaking any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse effects on historic properties located within the project area.

- Land and Marine Management: The proposed action would be constructed consistent with the CZMA and the ACAMP and would not result in adverse short or long-term impacts to land and marine management within the project area. There would be a potential long-term beneficial impact to adjacent public lands by reducing shoreline erosion landward of the reef structure.

- Aesthetics and Visual Resources: The proposed action would result in minor, short term visual impacts while construction equipment is used at the project site. The placement of navigational signs would result in a direct, long term, minor adverse impact on the aesthetics and visual resources of the area and these signs would become less intrusive over time.

- Tourism and Recreation: There would be short-term, minor adverse impacts to public access and use of open water areas for boat traffic during construction. Following construction, there would be minor adverse impacts to public access and recreation since the reefs could prevent free-flowing transit between the reef and the shoreline. Increased use of the created reef for fishing would be long-term and beneficial.

- Public Safety and Shoreline Protection: Health and safety measures would be followed during construction; therefore, adverse impacts are not anticipated. The proposed breakwaters are

expected to provide beneficial impacts and counteract erosion by moderating the gradient in the transport of sediment along the shore.

10.2.6 Cumulative Impacts

As discussed in Chapter 4, the CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined as "the impact on the 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" (40 C.F.R. § 1508.7).

The Point aux Pins Living Shoreline project cumulative impacts analysis tiers from the Final Phase III ERP/PEIS analysis of Alternative 4 (Contribute to Restoring Habitats, Living Coastal and Marine Resources, and Recreational Opportunities), which evaluated the type of restoration activity proposed for the Point aux Pins Living Shoreline project. The Final Phase III ERP/PEIS analysis of cumulative impacts relevant to the proposed Point aux Pins Living Shoreline Project is incorporated by reference into the following cumulative impacts analysis. The following analysis focuses on the potential additive effects of the proposed Point aux Pins Living Shoreline Project to the effects of past actions evaluated in the Final Phase III ERP/PEIS cumulative impacts analysis and the effects of some past, present, and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS.

10.2.6.1 Site Specific Review and Analysis of Cumulative Impacts to Relevant Resources

This section describes past, present, and reasonably foreseeable future actions that were not discussed in the Final Phase III ERP/PEIS, but which are relevant to identifying any cumulative impacts the proposed Point aux Pins Living Shoreline Project may have on a local scale. Context and intensity, defined in Section 10.2.5, are used to determine whether a potential significant cumulative impact from the Point aux Pins Living Shoreline project exists.

For the Point aux Pins Living Shoreline project, specifically, the relevant affected resources analyzed in this EA are:

- Geology and Substrates
- Hydrology and Water Quality
- Air Quality and Greenhouse Gas Emissions
- Living and Coastal Marine Resources
- Land and Marine Management
- Tourism and Recreation Use
- Aesthetics and Visual Resources

Those resources described in Section 10.2.5 as considered but not carried forward for further analysis would not have impacts and therefore, would not have cumulative impacts. Local and site-specific past, present and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS were investigated through conversations with ADCNR staff and searching websites relevant to the Point aux

Pins Living Shoreline Project. The local action area is defined as the site of the living shoreline project and immediate surroundings of those areas. Actions that would be relevant to the Point aux Pins Living Shoreline Project cumulative impacts analysis are defined here as those with similar scope, timing, impacts or location. Websites searched include:

- http://www.nfwf.org/whoweare/mediacenter/pr/Pages/gulf-main-pr-14-1117.aspx
- http://eli-ocean.org/gulf/restoration-projects-database/

This search provided the following additional information on one action that is relevant to the Point aux Pins Living Shoreline Project cumulative impacts analysis.

ERP I - Marsh Island Restoration: 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 will restore approximately 50 acres of salt marsh through the placement of a permeable segmented breakwater, the placement of sediments and the planting of native marsh vegetation. Additionally, the breakwater will provide protection for the existing 24 acres of Marsh Island, which has been experiencing shoreline loss at the rate of 5-10 feet per year. The Marsh Island Restoration Project is approximately 3 miles from the Point aux Pines Living Shorelines Project site. Point aux Pins Living Shoreline Project and the Marsh Island Restoration Project would both involve habitat restoration and construction of both projects could occur at the same time and contribute to cumulative impacts for the resources discussed below. The adjacent living shoreline project at Point aux Pins has already been constructed, and therefore, there would be no short-term construction related impacts with the proposed Point aux Pins Living Shoreline Project, but potential cumulative impacts long-term during operation.

Geology and Substrates

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.1 Geology and Substrates. The Final Phase III ERP/PEIS found that when Alternative 4 was analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to geology and substrates would likely occur. However Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts had the potential to result in some long-term beneficial cumulative impacts to geology and substrates in localized areas. Alternative 4 was not expected to contribute substantially to cumulative adverse impacts. The Point aux Pins Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

The analysis in Section 10.2.5.1.1 determined the Point aux Pins Living Shoreline Project would have a short term, minor, adverse impacts to geology and substrates. Activities that would occur in support of the Marsh Island Restoration Project would be expected to have a similar level of impact during construction. No short-term impacts would occur from the existing adjacent Point aux Pins living shoreline. All three projects would have long-term benefits from enhanced shoreline protection and habitat creation.

Based on these findings, the Point aux Pins Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to geology and substrates.

Hydrology and Water Quality

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.2 Hydrology and Water Quality. The Final Phase III ERP/PEIS found that When analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to water quality and hydrology. Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to hydrology and water quality in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities. The Point aux Pins Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

The analysis in Section 10.2.5.1.2 determined the Point aux Pins Living Shoreline Project would have a short term, minor, adverse impacts to water quality and minimal impacts to hydrology. Activities that would occur in support of the Marsh Island Restoration Project would be expected to have a similar level of impact during construction. No short-term impacts would occur from the existing adjacent Point aux Pins living shoreline. All three projects would have long-term benefits from enhanced shoreline protection and habitat creation.

Based on these findings, the Point aux Pins Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to hydrology and water quality.

Air Quality and Greenhouse Gases

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.3, Air Quality and Greenhouse Gases. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to air quality or greenhouse gas emissions. To the extent that they increase CO2 absorption, Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in some long-term beneficial cumulative impacts to greenhouse gas emissions because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities. The Point aux Pins Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

As described in Section 10.2.5.1.3, the Point aux Pins Living Shoreline Project would have a temporary, minor adverse impact on air quality and GHGs. When taken into consideration with the Marsh Islands Restoration Project which would also have temporary and localized impacts, the expected cumulative impacts are consistent with those analyzed in the Final Phase III ERP/PEIS. No short-term impacts would occur from the existing adjacent Point aux Pins living shoreline.

Based on these findings, the Point aux Pins Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to air quality and GHG levels.

Living Coastal and Marine Resources

This analysis tiers from the Phase III ERP/PEIS, Section 6.8.4.2.2, Living Coastal and Marine Resources. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to living coastal and marine resources. Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to living coastal and marine resources in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities. The Point aux Pins Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 10.2.1.6.1, the Point aux Pins Living Shoreline Project is anticipated to have short-term and localized impacts to living coastal and marine resources with long-term beneficial impacts from habitat creation and shoreline protection. During construction, similar short-term, localized minor adverse impacts would be expected as a result of the Marsh Islands project, with similar long-term benefits. While construction could occur at the same time, impacts of each project would be localized and are not expected to contribute to adverse cumulative impacts. No short-term impacts would occur from the existing adjacent Point aux Pins living shoreline. The area would experience long-term benefits from all three projects due to shoreline protection and habitat creation.

Based on these findings, the Point aux Pins Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to living coastal and marine resources.

Land and Marine Management

This analysis tiers from the Phase III ERP/PEIS, Section 6.8.4.3.4, Land and Marine Management. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to land and marine management. Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to land and marine management in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities from the alignment of management goals and assistance provided to management and staff to best manage properties from restoration, conservation and recovery efforts. The Point aux Pins Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 10.2.5.1.10, the Point aux Pins Living Shoreline Project is anticipated to have a minor, short-term adverse impact on land and marine management, lasting during construction activities, with all applicable laws and regulations regarding coastal zone management being adhered to

and minimizing potential impacts. There would be a potential long-term beneficial impact to adjacent public lands by reducing shoreline erosion landward of the reef structure. The Marsh Islands project would be expected to result in similar short-term minor adverse impacts, but due to their localized nature, would not contribute to cumulative impacts when combined with the Point aux Pins Living Shoreline Project. No short-term impacts would occur from the existing adjacent Point aux Pins living shoreline. Long-term benefits from all three projects would occur from the protection of lands.

Based on these findings, the Point aux Pins Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to land and marine management.

Aesthetics and Visual Resources

This analysis tiers from the Phase III ERP/PEIS, Section 6.8.4.3.8, Aesthetics and Visual Resources. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to aesthetics and visual resources. Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to aesthetics and visual resources in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities. The Point aux Pins Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 10.2.5.1.11, the Point aux Pins Living Shoreline Project could result in a minor, long-term impact on aesthetic and visual resources, from the placement of navigational signage. When taken into consideration with Marsh Island project and existing adjacent living shorelines projects, the minor, long-term adverse visual impact is of both projects would be minor and localized.

Based on these findings, the Point aux Pins Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to aesthetics and visual resources.

Tourism and Recreational Use

This analysis tiers from the Phase III ERP/PEIS, Section 6.8.4.3.5, Tourism and Recreational Use. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to tourism and recreational use. Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to tourism and recreational use in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities. The Point aux Pins Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 10.2.5.1.12, the Point aux Pins Living Shoreline Project is anticipated to have a minor short term, adverse impact to recreational use of the area during construction since the area

would be avoided by recreational boaters. The action would result in a beneficial impact due to increased use of created reef for fishing due to the expected use of the reef by recreationally important fish such as speckled trout and red drum. Any closures to recreational use from the Marsh Islands project would be localized, and would not interact with any potential closures from the Point aux Pins Living Shoreline project. No short-term impacts would occur from the existing adjacent Point aux Pins living shoreline. Long-term beneficial cumulative impacts are anticipated to recreational use in the area from the completion of all three projects.

Based on these findings, the Point aux Pins Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to tourism and recreational use.

10.2.1.1 Phase III and Proposed Phase IV Projects

Proposed Projects

Due to the minor, local and temporary impacts from the project, the Point aux Pins Living Shoreline Project is not anticipated to contribute to potential adverse cumulative impacts in combination with other Phase IV projects. In terms of location, the closest Phase IV proposed project to the Point aux Pins Living Shoreline Project is the Shell Belt and Coden Belt Roads Living Shoreline Project. That project consists of creating a living shoreline to reduce shoreline erosion. Cumulatively, these two projects would produce minor, short-term adverse environmental impacts from disturbance to natural and human resources (water quality, geology and substrates, coastal and marine resources, noise, tourism and recreation, and visual and aesthetics). Both of these efforts would contribute to beneficial impacts through the reduction in shoreline erosion, protection of water resources from breakwaters, and habitat enhancement. The closest Phase III project to the Point aux Pins Living Shoreline Project is the Swift Tract Living Shoreline Project. That project will employ living shoreline techniques that utilize natural and/or artificial breakwater material to stabilize shorelines along an area in the eastern portion of Bon Secour Bay, Alabama. Cumulatively, these two projects would not produce adverse environmental impacts in the short-term as construction activities would not be expected to occur at the same time. Further, the Swift Tract site is approximately 25 miles from the Point aux Pins Living Shoreline Project site, and is geographically disconnected from each other for contribution to adverse impacts. Both projects would contribute to beneficial impacts through the reduction in shoreline erosion, protection of water resources from breakwaters, and habitat enhancement in the general area.

10.2.7 Summary and Next Steps

The proposed Point aux Pins Living Shoreline project would include shoreline protection and restoration and support increased benthic secondary productivity. It would use artificial breakwater material to prevent shoreline erosion and increase habitat for benthic species. The project is consistent with Alternative 4 (Preferred Alternative) of the Final Phase III ERP/EIS. Draft NEPA analysis of the environmental consequences suggests that while minor adverse impacts to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would provide long-term benefits by creating habitat and protecting shorelines. The Trustees have started coordination and reviews under the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and

Management Act, the National Historic Preservation Act, the Marine Mammal Protection Act, the Bald and Golden Eagle Protection Act, and other federal statutes. Pursuant to the Coastal Zone Management Act of 1972, federal actions must be consistent with the federally approved coastal management programs for states where the activities would affect a coastal use or resource of the state. The Federal Trustees' consistency determination for this project was submitted to the Alabama Department of Environmental Management (ADEM) on May 21, 2015. Via letter dated June 24, 2015, ADEM concurred with that determination of consistency with the enforceable policies of the Alabama Coastal Area Management Program for these proposed activities. Additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation. The Essential Fish Habitat consultation required under the Magnuson-Stevens Fishery Conservation and Management Act is complete with a finding of no adverse impacts to Essential Fish Habitat. The Trustees have completed coordination and reviews under the Marine Mammal Protection Act and determined that this project does not require authorization under the MMPA

Coordination and informal consultation with the USFWS under the ESA, MBTA and BGEPA has been completed. The USFWS concurred that no threatened, endangered, or candidate species or critical habitat under their jurisdiction or other protected species would be adversely affected as a result of implementing this proposed project. Section 7 Endangered Species Act Consultation with NMFS for threatened and endangered species and their critical habitats under their jurisdiction was initiated in May 2015 and is not yet complete.

The Trustees have initiated coordination and review under Section 106 of the NHPA. A complete review of this project will be completed prior to project implementation. NHPA Section 106 and Tribal consultations may further identify potential cultural resources in the project areas and any mitigation measures necessary to protect those resources.

The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. Public comments and Trustee responses are found in Chapter 15.

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Chapter 11: Shell Belt and Coden Belt Roads Living Shoreline Project

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11.1 Shell Belt and Coden Belt Roads Living Shoreline Project: Project Description

11.1.1 Project Summary

The Shell Belt and Coden Belt Roads Living Shoreline Project will employ shoreline restoration techniques to increase benthic productivity and enhance the growth of planted native marsh vegetation. The project will be located in the Portersville Bay portion of Mississippi Sound, seaward of the southernmost portions of Shell Belt and Coden Belt Roads in Coden, Alabama. As the lead implementing Trustee, the Alabama Department of Conservation and Natural Resources will construct shoreline breakwaters to dampen wave energy and protect newly planted emergent vegetation while also providing habitat and increasing benthic secondary productivity. The specific breakwater elevations, construction techniques and design will be developed to maximize project success and meet state regulatory requirements. Over time, the breakwaters are expected to develop into reefs that support benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, and crabs. Marsh vegetation is expected to become established further enhancing both primary and secondary productivity adjacent to the breakwaters.

11.1.2 Background and Project Description

The Shell Belt and Coden Belt Roads Living Shoreline Early Restoration project is located in Mississippi Sound, Alabama (see Figure 11-1, Figure 11-2, and Figure 11-3).

This living shoreline project area is located along the stretch of shoreline between Bayou la Batre and Bayou Coden in Mississippi Sound, Alabama. Mississippi Sound is an estuarine system separated from the Gulf of Mexico by barrier islands in Alabama and Mississippi. Habitats in and around Mississippi Sound include tidal wetlands and swamps, salt marshes, aquatic grass beds, oyster reefs, maritime and palustrine upland forests, and estuarine soft-bottom habitat.

Construction activities will include placement of intertidal breakwaters waterward of the shoreline that may utilize artificial Wave Attenuation Units (WAUs) and that will generally follow a +0.5 to +1.0 foot Mean Lower Low Water (MLLW) target crest elevation. The breakwaters will likely have 10 foot crest widths, based on desired wave reduction, and will be designed with a height that falls within the mean high and low water lines (intertidal). The specific breakwater elevations and technique designs will be selected to maximize project effectiveness and meet federal and state regulatory requirements. Over time, the breakwaters are expected to develop into reefs that support benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, and crabs.

Figure 11-1. Site Location



Figure 11-2. Proposed Project Layout – Shell Belt and Coden Belt Roads Living Shoreline

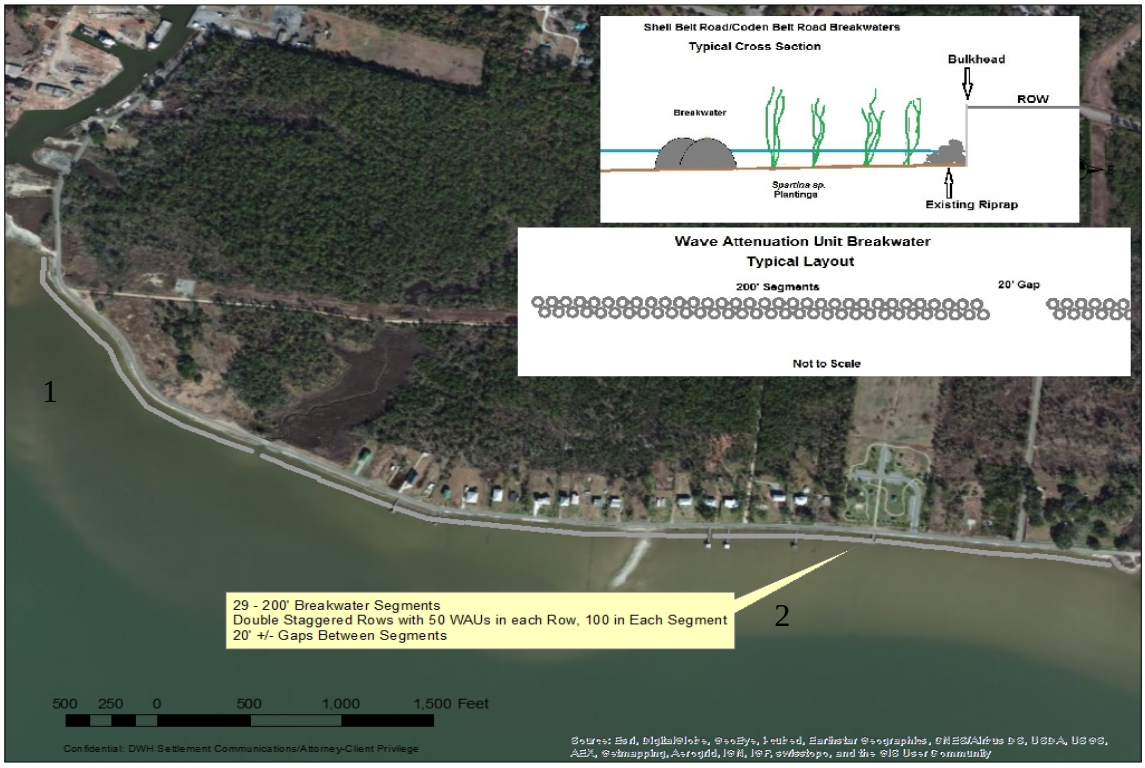
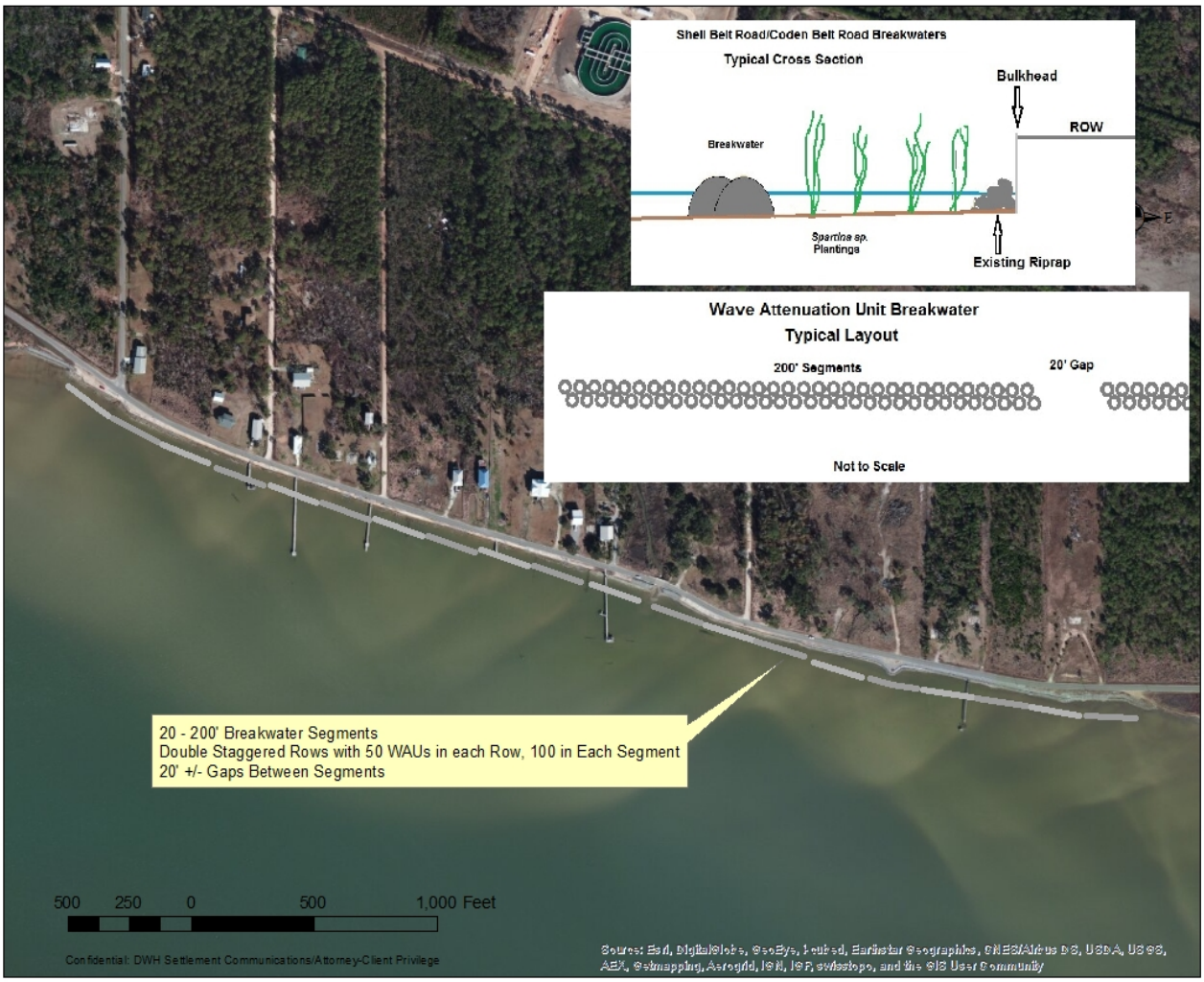


Figure 11-3. Proposed Project Layout – Shell Belt and Coden Belt Roads Living Shoreline



11.1.3 Evaluation Criteria

This project meets the evaluation criteria established by OPA regulations and the Framework Agreement. The north central Gulf coast experienced a loss of salt marsh habitat and benthic secondary productivity, as a result of the Spill. The project will restore injured benthic secondary productivity by constructing breakwaters, enhance injured salt marsh habitat by planting new marsh vegetation, and compensate for interim losses of salt marsh habitat and benthic secondary productivity in Alabama. Thus, the nexus to resources injured by the Spill is clear (see 15 C.F.R. § 990.54(a)(2) and Sections 6a-6c of the Early Restoration Framework Agreement).

The project is technically feasible utilizing commonly used restoration techniques and can be implemented with minimal delay. Several studies of living shoreline techniques have found that these projects can successfully reduce shoreline erosion while providing habitat and water quality benefits (LaPeyre, et al. 2013[1], Scyphers et al. 2012[2], Berman et al. 2007[3]). ADCNR has successfully implemented similar shoreline projects throughout Mobile Bay. For these reasons, the project has a high likelihood of success (See 15 C.F.R. § 990.54(a)(3) and Section 6e of the Early Restoration Framework Agreement).

A thorough environmental assessment, including review under applicable environmental statutes and regulations, is described in Section 11.2. That preliminary review indicates that adverse effects from the project will largely be minor, localized, and of short duration. In addition, the best management practices and measures to avoid or minimize adverse effects described in Section 11.2 would be implemented. As a result, collateral injury would be avoided or minimized during project implementation (15 C.F.R. § 990.54(a)(4)).

Cost estimates are based on similar past projects, and indicate that the project can be implemented at a reasonable cost. (See C.F.R. § 990.54(a)(1)). Therefore, the project is feasible, cost effective, and consistent with long-term restoration needs (See C.F.R. § 990.54(a)(1),(3), and Sections 6d-6e of the Early Restoration Framework Agreement).

11.1.4 Performance Criteria and Monitoring

The overall goal of this restoration project is to create habitat that supports benthic secondary productivity thus enhancing the ecosystem function of the area. Monitoring activities at the site are planned over a 5-year period. The project's monitoring approach will incorporate a mix of quantitative and qualitative monitoring efforts to ensure project designs are correctly implemented during construction and in a subsequent period, defined by the contract developed for the implementation of this project, where corrective actions could be taken by the implementing Trustee (ADCNR) to ensure the project meets the objectives described below.

The specific restoration objectives relevant for this monitoring plan are: 1) construction of breakwaters that meet project design criteria and that are sustained for the expected lifespan of the project to support benthic secondary productivity, 2) support habitat utilization of the breakwaters invertebrate infauna and epifauna to increase secondary benthic productivity at the project site, and 3) protection of newly planted salt marsh vegetation. The monitoring plan for this project is provided in Appendix B.

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[1] La Peyre, M.K., Schwarting, Lindsay, and Miller, Shea, 2013, Preliminary assessment of bioengineered fringing shoreline reefs in Grand Isle and Breton Sound, Louisiana: U.S. Geological Survey Open-File Report 2013–1040, 34 p.

[2] Scyphers, S.B., SB, Powers, S.P., SP, Heck, K.L. KL Jr.,, Byron, D. (2011) Oyster Reefs as Natural Breakwaters Mitigate Shoreline Loss and Facilitate Fisheries. PLoS ONE 6(8): e22396. doi:10.1371/journal.pone.0022396.

[3] Berman, Marcia, Harry Berquist, Julie Herman, Karinna Nunez, 2007. The Stability of Living Shorelines – An Evaluation: Final Report submitted to NOAA Chesapeake Bay Program Office under grant number NA04NMF4570358.

Performance criteria will be used to determine restoration success or the need for corrective action (15 C.F.R. § 990.55(b)(1)(vii)). For restoration projects, since full recovery may occur over a long time frame, performance criteria typically represent interim milestones that will help project managers determine if the project is yielding improvements along an acceptable trajectory. The specific performance criteria and details for subsequent monitoring are provided in the monitoring plan for this project included in Appendix B.

11.1.5 Maintenance

There will be no short- or long-term maintenance activities required for these structures due to the materials being utilized. As navigational signage weathers and wears it will be replaced as appropriate, but this will involve replacing the sign face and will not include additional ground disturbance.

11.1.6 Offsets

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Resource Equivalency Analysis (REA) and Habitat Equivalency Analysis (HEA) to estimate appropriate biological and habitat Offsets for the Shell Belt and Coden Belt Roads Living Shoreline Project. Habitat Offsets were expressed in DSAYs[4] of Salt Marsh Habitat; the biological Offsets were expressed as DKg-Ys of benthic Secondary Productivity.

Habitat Offsets were estimated for salt marsh habitat protected by this restoration project, based on the expected spatial extent and duration of improvements attributable to the project. In estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, anticipated protection of newly created marsh provided by the project and the time period over which the project would continue to provide benefits. The Trustees and BP agreed that if this restoration project is selected for implementation, BP will receive Offsets of 50 DSAYs of Salt Marsh Habitat[5], applicable to Salt Marsh Habitat injuries in Alabama, as determined by the Trustees' total assessment of injury for the Spill.

If the combination of Offsets for Salt Marsh Habitat injuries from the Phase I and Phase III early restoration projects in Alabama and from the Shell Belt and Coden Belt Roads Living Shoreline Project exceeds the Salt Marsh Habitat injuries in Alabama, then the remaining unused Salt Marsh Habitat DSAYs from this project will be converted to Secondary Productivity[6] (at a rate of 1,000 Dkg-Ys of Secondary Productivity per Salt Marsh Habitat DSAY) and applied to Estuarine Dependent Aquatic Biomass[7] injuries first in Alabama waters and then, if that category of injury is exhausted in Alabama

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[4] **Discounted Service Acre Years (DSAYs)** are defined in Appendix C.

[5] **Salt Marsh Habitat** is defined in Appendix C.

[6] **Secondary Productivity** is defined in Appendix C

[7] **Estuarine Dependent Aquatic Biomass** is defined in Appendix C.

waters, to such injury in federal waters on the Continental Shelf. These NRD Offsets for Salt Marsh Habitat (and, if applicable, Secondary Productivity) shall not apply to injuries in Texas, Louisiana, Mississippi and/or Florida.

Benthic Secondary Productivity Offsets were estimated for expected increases in invertebrate infaunal and epifaunal biomass attributable to the restoration project. In estimating DKg-Ys, the Trustees considered a number of factors, including, but not necessarily limited to, typical productivity in the project area, estimated project lifespan and project size. The Trustees and BP agreed that if this restoration project is selected for implementation, BP will receive Offsets of 129,632 DKg-Ys of benthic Secondary Productivity, applicable to benthic Secondary Productivity injuries in Alabama, as determined by the Trustees' total assessment of injury for the Spill.

If the combination of Offsets for benthic Secondary Productivity from the Phase III early restoration projects in Alabama and from this Shell Belt and Coden Belt Roads Living Shoreline Project exceeds the injury to benthic Secondary Productivity in Alabama waters then the remaining unused Offsets for benthic Secondary Productivity from this project will be applicable to injuries to Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat[8] at a rate of 5 Dkg-Ys of Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat per 100 Dkg-Ys benthic Secondary Productivity (up to a maximum of 6,482 Dkg-Ys of Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat). These remaining Offsets will be applied first to offset such injuries in Alabama waters and then, if that category of injury is exhausted in Alabama waters, to such injuries in federal waters on the Continental Shelf. These NRD Offsets for benthic Secondary Productivity (and, if applicable, Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat) shall not apply to injuries in Texas, Louisiana, Mississippi and/or Florida.

Appendix C provides further definitions applicable to the Offsets detailed in this section. These Offset types and amounts are reasonable for this project.

11.1.7 Estimated Cost

The estimated cost for this project is $8,050,000. This cost reflects cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, design, implementation, and monitoring.

[8] **Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat** is defined in Appendix C.

11.2 Shell Belt and Coden Belt Roads Living Shoreline Project: Environmental Assessment

The proposed restoration project involves placement of breakwater segments. The specific breakwater elevations, construction techniques and design will be developed to maximize project success and meet federal and state regulatory requirements.

11.2.1 Introduction, Background, Purpose and Need

CEQ encourages federal agencies to "tier" their NEPA analyses from other applicable NEPA documents to create efficiency and reduce redundancy, and has issued new guidance on the use of programmatic NEPA documents for tiering (CEQ 2014a).

Tiering has the advantage of not repeating information that has already been considered at the programmatic level so as to focus and expedite the preparation of the tiered NEPA review(s). When a programmatic environmental assessment or PEIS has been prepared and an action is one anticipated in, consistent with, and sufficiently explored within the programmatic NEPA review, the agency need only summarize the issues discussed in the broader statement and incorporate discussion from the broader statement by reference and concentrate on the issues specific to the subsequent tiered proposal (CEQ 2014a).

A federal agency may prepare a PEIS to evaluate broad actions (40 C.F.R. § 1502.4(b); see Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18026 (1981). When a federal agency prepares a PEIS, the agency may "tier" subsequent narrower environmental analyses on site-specific plans or projects from the PEIS (40 C.F.R. § 1502.4(b); 40 C.F.R. § 1508.28). Federal agencies are encouraged to tier subsequent narrower analyses from a PEIS to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review (40 C.F.R. § 1502.20). The Final Phase III ERP/PEIS was prepared for use in tiering subsequent early restoration plans and projects, such as Phase IV.

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the programmatic portion of the Final Phase III ERP/PEIS. This EA qualifies for tiering from the Final Phase III ERP/PEIS in accordance with Department of the Interior regulations (43 C.F.R. § 46.140, Using Tiered Documents, b and c).

This project type is consistent with the Final Phase III ERP/PEIS's Preferred Alternative as described in the 2014 Record of Decision (79 Fed. Reg. 64831-64832 (October 31, 2014)) and the Trustees find that the conditions and environmental effects described in the broader NEPA document (with updates as described in Chapter 2) are valid. Specifically, this project tiers from the analyses found in sections of the PEIS that describe Alternative 4 (Preferred Alternative: Contribute to Restoring Habitats, Living Coastal and Marine Resources and Recreational Opportunities) under Project Type 2: Protect Shorelines and Reduce Erosion including Section 5.3.3.2 and Environmental Consequences, Section 6.3.2. This EA incorporates by reference the analysis found in the PEIS in those sections. This EA also incorporates by

reference all Early Restoration introductory, process, background, and Affected Environment information and discussion provided in the PEIS (Chapters 1 through 6).

11.2.1.1 Background

This living shoreline project area is located along the stretch of shoreline between Bayou la Batre and Bayou Coden in Mississippi Sound, Alabama, adjacent to an already hardened shoreline in an unvegetated mudflat. Mississippi Sound is an estuarine system separated from the Gulf of Mexico by barrier islands in Alabama and Mississippi. Habitats in and around Mississippi Sound include tidal wetlands and swamps, salt marshes, aquatic grass beds, oyster reefs, maritime and palustrine upland forests, and estuarine soft-bottom habitat.

Construction activities would include placement of intertidal breakwaters waterward of the shoreline that may utilize artificial WAUs and that would generally follow a +0.5 to +1.0 foot MLLW target crest elevation. The breakwaters would likely have 10 foot crest widths, based on desired wave reduction, and would be designed with a height that falls within the mean high and low water lines (intertidal). The specific breakwater elevations and technique designs would be selected to maximize project effectiveness and meet federal and state regulatory requirements. Over time, the breakwaters are expected to develop into reefs that support benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, and crabs.

This project also includes plantings of emergent marsh vegetation such as *Spartina alterniflora* or other similar native marsh vegetation species. ADCNR proposes to plant four rows of vegetation with approximately five feet between each individual plant. The planting would occupy approximately 50 feet between the shoreline and the constructed breakwater. Construction techniques would be determined by the selected contractor and conducted in compliance with all permit conditions and best management practices.

11.2.1.2 Purpose and Need

The purpose and need for this actions falls within the scope of the purpose and need of the programmatic portions of the Final Phase III ERP/PEIS because it would accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. The proposed project's purpose is to restore for natural resources injured in Alabama as a result of the *Deepwater Horizon* incident. The proposed project is needed to provide habitat, increase benthic secondary productivity, and protect and enhance coastal resources thus enhancing resources in coastal Alabama that were injured as a result of the Spill.

11.2.2 Scope of the EA

This project is proposed as part of Phase IV of Early Restoration. This EA tiers from the Final Phase III ERP/PEIS. The broader environmental analyses of these types of actions as a whole are discussed in the Final Phase III ERP/PEIS from which this EA is tiered. The information and analysis in this document supplements the programmatic analysis with site-specific information. This EA provides NEPA analysis

for potential impacts for site specific issues and concerns anticipated from implementation of the proposed action and the no action alternative.

The Trustees' Early Restoration project selection process is described in Section 2.1 of the Final Phase III ERP/PEIS. As described there, potential projects evolve from public scoping, ongoing public input through internet-accessible databases, review of current federal and state management plans and programs, and Trustee expertise and experience. From this broad list of project ideas, the Trustees' Early Restoration project selection process initially results in a set of proposed projects that, consistent with the Framework Agreement, are submitted to BP for review and consideration. One area considered for Early Restoration included protection of shorelines and measures to reduce erosion.

11.2.3 Project Alternatives – No Action Alternative

Both OPA and NEPA require consideration of the No Action alternative. For this section, there are two alternatives, the No Action and Proposed Action, Shell Belt and Coden Belt Roads Living Shoreline Project.

Under the No Action alternative the Trustees would not pursue the Shell Belt and Coden Belt Roads Living Shoreline Project as part of Phase IV Early Restoration. Under No Action, the existing conditions described in Chapter 3 of the Final Phase III ERP/PEIS would prevail. Restoration benefits associated with this project would not be achieved at this time.

11.2.4 Project Alternatives – Proposed Action

11.2.4.1 Project Location

The proposed Shell Belt and Coden Belt Roads Living Shoreline Project is located in south Mobile County in Coastal Alabama. The proposed project area is on the northern side of Mississippi Sound along the stretch of shoreline between Bayou la Batre and Bayou Coden in Alabama state waters (see Figure 11-1, Figure 11-2, and Figure 11-3).

11.2.4.2 Project Scope

The proposed Shell Belt and Coden Belt Roads Living Shoreline Project would employ living shoreline restoration techniques by creating rows of approximately 200 foot segments made of WAUs. In total approximately 49 segments are proposed with an approximate 20 foot gap between each segment, creating approximately 10,800 linear feet of breakwaters. The exact WAU type and number of segments may vary depending on final project design. The specific breakwater elevations and number of segments, construction techniques and design would be developed to maximize project success and meet regulatory requirements.

Upon completion of planning, design and permitting, a request for construction bids would be issued and a contract for construction issued in accordance with Alabama bid and procurement laws and regulations. It is anticipated that construction of the breakwaters would take place from the Shell Belt and Coden Belt Roads right of way (ROW), using large flatbed trucks to transport the breakwater units to

the sites. A large long-reach track-hoe or other similar equipment located on the adjacent water bottoms would then be utilized to place the breakwater units in the appropriate configuration. After planning and design are complete, if it is more feasible, the construction of the breakwaters could take place using shallow draft barges and tugs to transport the breakwater units. Actual equipment and construction techniques would be determined by the selected contractor and conducted in compliance with all permit conditions and best management practices. The following assumptions about vehicle and barge operation for the implementation of the proposed project are based on previous similar construction operations conducted by ADCNR. It is anticipated that the above described equipment would be on site approximately 2 months. A work day would range from between 8 and 14 hours.

Over time, the breakwaters are expected to provide habitat that supports benthic secondary productivity, including, but not limited to, bivalve mollusks, annelid worms, shrimp, crabs, and small forage fishes.

This project also includes plantings of emergent marsh vegetation such as *Spartina alterniflora* or other similar native marsh vegetation species. ADCNR proposes to plant four rows of vegetation with approximately five feet between each individual plant. The planting will occupy approximately 50 feet between the shoreline and the constructed breakwater. Construction techniques would be determined by the selected contractor and conducted in compliance with all permit conditions and best management practices.

The implementation of the Shell Belt and Coden Belt Roads Living Shoreline Project would take up to approximately 24 months and would include the following activities:

- Planning, site investigations, and design - approximately 6 to 12 months; concurrently it would take approximately 6 months for permitting and consultation.
- Construction – approximately 2 months.

No maintenance activities would be required due to the materials being utilized. As navigational signage weathers and wears it would be replaced as appropriate, but this would involve replacing the sign face and would not include additional ground disturbance.

11.2.5 Affected Environment and Environmental Consequences

Under the NEPA, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

In order to determine whether an action has the potential to result in significant impacts, the **context and intensity** of the action must be considered. **Context** refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). **Intensity** refers to the severity of impact and could include the timing of the action (e.g., more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse.

For purposes of this document, impacts are characterized as minor, moderate or major, and temporary or long-term. The analysis of beneficial impacts focuses on the duration (short- or long-term), without attempting to specify the intensity of the benefit. The definition of these characterizations is consistent with that used in the Final Phase III ERP/PEIS, and can be found in Appendix D.

According to the CEQ Regulations for Implementing NEPA (Section 1502.1 and 1502.2) agencies should "focus on significant environmental issues" and for other than significant issues there should be "only enough discussion to show why more study is not warranted." The programmatic environmental analysis looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resources that are not expected to be affected are considered but not evaluated further. For this project, the resource areas that have not been analyzed in detail are listed below, along with the reasons why they are not expected to be affected.

- Socioeconomics/Environmental Justice: The socioeconomic environment consists of demographics, the local and regional economy, and environmental justice. Executive Order 12898 (General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) requires all agencies to incorporate these topics into their environmental assessments by identifying and addressing disproportionately high and adverse human health or environmental effects of their proposed actions on minorities and low-income populations or communities. Placement of the breakwaters would not result in a net change of the current racial and ethnic composition, existing industries, or employment in Mobile County. Furthermore, no environmental effects on minorities or low-income populations—as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996)—are expected. Therefore, the socioeconomic environment is not carried forward for detailed analysis in this assessment.
- Noise: Noise from the construction equipment would be evident in the project area. While this noise would be evident to those workers on the job and any users of the shoreline in proximity of the project, it would be short-term and negligible. Return to normal noise levels would be achieved at the end of each workday and after completion of the job. The project is not anticipated to increase vessel traffic or noise impacts in the long term. Because impacts from noise would be at low levels and short-term this impact area is not carried forward for detailed analysis in this assessment.

For those resources carried forward for detailed analysis, the analysis first considers if the impacts of the proposed project are within the impacts evaluated for the project type within the Final Phase III ERP/PEIS. After consideration of how the impacts of the proposed project are evaluated in context of the programmatic document, site specific impacts are evaluated.

11.2.5.1 Physical Environment

11.2.5.1.1 Geology and Substrates

Affected Resources

Geology

Mississippi Sound is within the East Gulf Coast Plain physiographic province. This physiographic province is bounded by the fall line to the north and by coastal lowlands to the south and is generally characterized by subtle topography and diverse estuarine and tidal areas. The Shell Belt and Coden Belt Roads Living Shoreline Project site falls within the Gulf Barrier Islands and Coastal Marshes Level IV Ecoregion.

Subaqueous Soils

The sediments of the Mississippi Sound range from sand to clays with various mixtures of sand, silt, and clay covering most of the bay bottom (USGS 2007). Soils at the Shell Belt and Coden Belt Roads Living Shoreline Project site are primarily Axis mucky sandy clay loam, which is a very poorly drained soil with frequent flooding and ponding (Soil Survey Staff 2015).

Environmental Consequences

No Action

Under the no action alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to geology and substrates would occur. The beneficial impacts from implementation of this project, including habitat enhancement would not be realized.

Proposed Action

Sections 6.3.2 and 6.7.1.1 of the Final Phase III ERP/PEIS describe the impacts to geology and substrates from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that placement of breakwaters and living shorelines could benefit geology and substrates by reducing erosion and increasing the lifespan of shorelines near passes, inlets, or in areas where erosion rates are high and sediment supply is limited. These beneficial effects would be long-term because they would last beyond the construction period. It also noted that there would be the potential for short-term impacts to geology and substrates from installation of shore protection systems. Use of equipment in submerged substrates would disturb sediments; these actions would result in short-term minor adverse effects limited to the area where construction activity occurred. For this project, impacts to geology and substrates were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

The geological and substrate resources in the project area would be affected through the modification of soft bottom bay habitat into breakwaters (hardened substrate). The project footprint would occur in

fine-grained sediment and soft bottoms that would be covered with breakwater segments. Additionally, appropriate signage for marine traffic would be placed on approximately 12-inch diameter posts adjacent to the breakwaters, which would impact a small area of soft bottom. Construction of all elements is anticipated to take 2 months. A full schedule would be dependent on the date funding becomes available and contractor award times.

There would be long-term, minor, adverse impacts from the disturbance to geology and substrates due to placement of hard, structural material over soft bottom. The installation of the pilings would have a short term, minor adverse impact to sediments. It is anticipated that all construction would occur from existing roadways along the shoreline, preventing potential impacts from compaction along the shoreline. Should this approach not be feasible, construction would occur in water and would still avoid issues of compaction along the shoreline. A long term benefit to the bottom substrates would be expected due to stabilization of sediments by the breakwater structures.

A range of potential mitigation measures for impacts to geology and substrates are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs planned to be implemented for this effort would include:

- Employment of standard BMPs for construction to reduce erosion.
- Use of existing access ways whenever possible. Temporary access roads would not be built in locations that would suggest a likelihood of excessive erosion (e.g., large slopes, erosive soils, proximity to water body). All temporary access roads would be restored when the action is completed, the soil would be stabilized, and the site would be re-vegetated.
- Selection and operation of heavy equipment to minimize adverse effects to the environment (e.g., minimally-sized, low-pressure tires, minimal hard turn paths for tracked vehicles, temporary mats or plates within wet areas or sensitive soils).

11.2.5.1.2 Hydrology and Water Quality

Affected Resources

Water Quality

Mississippi Sound has salinity levels of 10 to 28 parts per thousand (ppt) (Northern Economics 2014). This is lower than the Atlantic Ocean's average salinity of 35 ppt, due in part to the sound's estuarine environment. Water quality in the area is considered to be impaired due to the presence of *Enterococcus* bacteria (USEPA 2012). Turbidity is a common occurrence due to shallow depths, silts, windy conditions, and storm events. The major point source of pollution in the Portersville Bay portion of Mississippi Sound (where the project is located) is municipal discharge/sewage from the Bayou la Batre wastewater treatment plant, which is regulated under a National Pollutant Discharge Elimination System (NPDES) permit. Non-point sources are limited to septic systems, sanitary sewer overflow, and general stormwater runoff.

Floodplains

The project is located in FEMA designated Flood Zones according to the Flood Insurance Rate Maps (FIRMS) for Mobile County. (FIRM No. 01097C0768K Mobile County, (effective date March 17, 2010)). The project is located in Zone VE with base flood elevation of 15 feet. VE indicates coastal flood zones with velocity hazards (wave action) with base flood elevations determined.

Wetlands

The project is located in open water with little to no emergent herbaceous wetlands in the immediate project area. There are emergent wetlands directly east and west of the site. Emergent herbaceous wetlands are characterized by perennial non-woody plants, which can account for approximately 80 percent of the vegetative cover (MRLCC 2015). The soil or substrate in these wetlands is periodically saturated or covered with water. Emergent wetlands include marshes, meadows, and fens. There are no submerged aquatic vegetation (SAV) beds in the project area (Vittor 2009).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to hydrology or water quality would occur. The beneficial impacts from implementation of this project, including a reduction in storm surges on coastal wetlands and limiting the shoreward extent of saltwater flow, would not be realized.

Proposed Action

Sections 6.3.2 and 6.7.2.1 of the Final Phase III/ERP PEIS describe the impacts to hydrology and water quality from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that shoreline protection and erosion reduction could result in long-term beneficial impacts by reducing storm surges on coastal wetlands, and limiting the shoreward extent of saltwater flow. During construction, minor short-term adverse impacts were possible due to the risk of water quality contamination from equipment usage and boating traffic in construction areas and a potential increase in turbidity. For this project, impacts to geology and substrates were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

Potential mitigation measures for impacts to each of the hydrology and water quality categories discussed below are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs planned to be implemented for this effort include:

- Use of existing access ways whenever possible. Temporary access roads would not be built in locations that would suggest a likelihood of excessive erosion (e.g., large slopes, erosive soils, proximity to water body). All temporary access roads would be restored when the action is

completed, the soil would be stabilized, and the site would be re-vegetated. Temporary roads in wet or flooded areas would be restored shortly after the work period was complete.

- Maintenance of generators, cranes, and any other stationary equipment operated within 150 feet of any natural or wetland area as necessary to prevent leaks and spills from entering the water.
- Employment of standard BMPs for construction to reduce erosion.

Hydrology

Tides, currents, and salinity would be unaffected because the proposed project would have a minimal footprint located adjacent to the shoreline. There would be no anticipated impacts from placement of the breakwater structures since each structure would have gaps at least twenty feet wide that would allow normal tidal fluctuation around the breakwaters. Further, the breakwaters would be porous and water would be able to interchange through the structure.

Water Quality

Short term impacts to water quality would result from increased turbidity during material placement. During construction, BMPs, such as floating turbidity barriers, may be used to contain turbid water and reduce impacts to ambient water quality conditions. In the long term, the breakwaters are expected to contribute to localized water quality improvement due to the filtration capacity of oysters and other bivalves that would be anticipated to colonize the reefs. In terms of regulatory compliance, the placement of breakwaters as proposed under this project is considered "fill." No other fill and/or dredging would occur under this effort. The proposed discharge of fill material (placement of breakwaters) into waters of the United States, including wetlands, or work affecting navigable waters associated with this project would be coordinated with the U.S. Army Corps of Engineers (USACE) pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). Coordination with the USACE and final authorization pursuant to CWA/RHA would be completed prior to project implementation. A state water quality certification would be obtained from the Alabama Department of Environmental Management prior to construction.

Floodplains

The project is located below the MHWL and would not impact the floodplain in the project area.

Wetlands

The project would not adversely affect wetlands as the breakwaters would be constructed from the Shell Belt Road and Coden Belt ROW. If construction entirely from the roadway is not possible, any in-water construction efforts would be in open water and would not impact wetlands. After construction, the breakwaters would be anticipated to reduce wave energy reaching the shoreline and would help protect the planted fringe of salt marsh habitat.

11.2.5.1.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

The EPA defines ambient air in 40 C.F.R. Part 50 as "that portion of the atmosphere, external to buildings, to which the general public has access." In compliance with the 1970 Clean Air Act (CAA) and the 1977 and 1990 Clean Air Act Amendments (CAAA), the EPA has promulgated National Ambient Air Quality Standards (NAAQS). Under the CAA, the EPA establishes primary and secondary air quality standards. Primary air quality standards protect the public health, including the health of "sensitive populations, such as people with asthma, children, and older adults." Secondary air quality standards protect public welfare by promoting ecosystems health, and by preventing decreased visibility, and damage to crops and buildings. The EPA has set NAAQS for the following six criteria pollutants: ozone, particulate matter (PM 2.5 and 10), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and lead. Individual states may promulgate their own ambient air quality standards for these "criteria" pollutants, provided that they are at least as stringent as the federal standards. In Table 11-1, below, both State of Alabama and federal primary ambient air quality standards for criteria air pollutants are presented. The Mobile area is currently in attainment with NAAQS required by EPA (40 C.F.R. Part 50) (USEPA 2015).

Table 11-1. State and federal ambient standards for criteria air pollutants

POLLUTANT	AVERAGING PERIOD	FEDERAL PRIMARY STANDARD	ALABAMA STATE STANDARD
Ozone	8-hour	0.075 ppm	Same as Federal
PM2.5	Annual (arithmetic mean)	12.0 µg/m3	Same as Federal
	24-hour	35 µg/m3	Same as Federal
PM10	24-hour	150 µg/m3	Same as Federal
Carbon Monoxide	8-hour	9 ppm	Same as Federal
	1-hour	35 ppm	Same as Federal
Nitrogen Dioxide	Annual (arithmetic mean)	0.053 ppm	Same as Federal
	1-hour	0.100 ppm	Same as Federal
Sulfur Dioxide	1-hour	75 ppb	Same as Federal
ppm = parts per million ppb = parts per billion Source: EPA, 2015 http://www.epa.gov/air/criteria.html And http://www.adem.state.al.us/alEnviroReglaws/files/Division3.pdf			

Greenhouse Gases

Greenhouse Gases (GHGs) are chemical compounds found in the Earth's atmosphere that absorb and trap infrared radiation as heat. Global atmospheric GHG concentrations are a product of continuous emission (release) and removal (storage) of GHGs over time. In the natural environment, this release and storage is largely cyclical. For instance, through the process of photosynthesis, plants capture

atmospheric carbon as they grow and store it in the form of sugars. Human activities such as deforestation, soil disturbance, and burning of fossil fuels disrupt the natural cycle by increasing the GHG emission rate over the storage rate, which results in a net increase of GHGs in the atmosphere. The principal GHGs emitted to the atmosphere through human activities are carbon dioxide (CO2), methane, nitrous oxide, and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, with CO2 accounting for the largest quantity GHG emitted.

Criteria air pollutants and GHG emissions are largely generated by electricity production, vehicular movements, and commercial and residential buildings using electricity. GHG emissions would result from both the implementation and operation of the proposed project from the use of vessels during construction and monitoring activities.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to air quality or GHG would occur.

Proposed Action

Sections 6.3.2 and 6.7.3.1 of the Final Phase III ERP PEIS describe the impacts to air quality and greenhouse gases from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that short-term minor to moderate adverse impacts to air quality in the project vicinity could occur from the use of construction equipment and the potential for short-term minor adverse impacts from fugitive dust. For this project, impacts to air quality and GHG were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

Potential mitigation measures for impacts to air quality and greenhouse gases are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would be implemented as part of this action would include:

- Use of existing access ways whenever possible. Temporary access roads would not be built in locations that would suggest a likelihood of excessive erosion (e.g., large slopes, erosive soils, proximity to water body). All temporary access roads would be restored when the action is completed, the soil would be stabilized, and the site would be re-vegetated.
- Maintenance of generators, cranes, and any other stationary equipment operated within 150 feet of any natural or wetland area as necessary to prevent leaks and spills from entering the water.

Air Quality

Project implementation would require the use of heavy equipment. Specifically, diesel-powered trucks or tug boats would be used to move the WAUs to the project site and a diesel excavator would be used to place the WAUs. This equipment would emit criteria pollutants such as PM2.5 and NO_2. However, the

emissions from either construction method would not occur in proximity to sensitive receptors and the impact on ambient concentrations in the immediate vicinity of the construction activity would be temporary. No air quality permits are required for this type of project and violations of state air quality standards are not expected. Air quality impacts during construction are expected to be localized, minor, and short-term.

Greenhouse Gas Emissions

The use of trucks and an excavator to construct the project would contribute to a temporary increase in GHG emissions. If construction would occur in water, cars, trucks, cranes, crew boats, backhoes, small craft vessels, tugboats, and other equipment could be utilized.

A unit of 25,000 metric tons of CO_2-equivelent[9] (CO2e) GHG emissions per annum is used here as a threshold to gauge whether a more detailed analysis should be considered for construction period emissions from the proposed project. The 25,000 metric tons of CO_2 provides a useful threshold for discussion and disclosure of GHG emissions because it has been used and proposed in rulemaking under the Clean Air Act (e.g., USEPA Mandatory Reporting of Greenhouse Gases Final Rule, 74 Fed. Reg. 56260, October 30, 2009). In addition, revised draft NEPA guidance from CEQ on climate change and GHG effects also uses the reference point of 25,000 metric tons of CO2e greenhouse gas emissions, although this figure is not a significance threshold (CEQ 2014b).

To determine if the proposed project has the potential to exceed 25,000 metric tons CO_2e, the potential emissions associated with haul truck and excavator use were quantified. A simplified emissions modeling exercise using MOVES2014, which includes the calculation methods used by NONROAD2008 for off-road constriction equipment. The analysis was conducted for January 2015, using EPA-default data for Mobile County, Alabama. The resulting CO_2 emission factor for a 600 horsepower (HP) excavator was 536.33 grams per HP-Hour or 321,798 grams/hr. Assuming 8 hours of operation per weekday at maximum load for two months (320 hours), this would result in a total of 103 metric tons of CO2 from the use of the excavator. A similar quantity of emissions could result from haul truck operations for a 12 hour period. Therefore it can be concluded that total project emissions would be well under 25,000 metric tons CO_2-equivelent and further detailed greenhouse gas emissions analysis is not warranted.

If in-water construction occurs, the analysis assumed a 650 horsepower (HP) diesel tugboat operating 8 hours per weekday for two months or 320 hours total. 650 HP is equivalent to 484.7 kilowatts. The equation for calculating emissions is as follows:

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[9] CO2-equivelent is a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). For example, methane has a GWP of 21, which means that methane will cause 21 times as much warming as an equivalent mass of carbon dioxide over a 100-year time period. Expressing GHG emissions on CO2-equivelent basis provides a common unit for comparing the total emissions of various GHGs.

Emissions (grams) = engine power (kW) x LF x activity (hours) x EF (g/kW-hr)

Where:

engine power = rated engine power

LF = load factor for the engine

activity = hours at the given load

EF = emissions factor that expresses mass emissions (grams) in terms of kW-hrs (g/kW-hr)

The source of the tugboat engine emissions factors was an emissions inventory study conducted for the Port Authority of New York and New Jersey in 2012 (PANYNJ 2012). This study reported the following tugboat engine greenhouse gas emission factors:

- CO2: 690 g/kW-hr
- N2O: 0.08 g/kW-hr
- CH4: 0.23 g/kW-hr

To ensure tugboat emissions were assessed conservatively, a load factor of 100% was used (engine operating at maximum power during all hours of operating). A more realistic load factor cited in the PANYNJ study for tugboat harbor operations is 31%.

Based on these assumptions, the total greenhouse gas emissions attributable to tugboat operations during construction is 112 tons CO2-equivelent. Emissions from a small excavator on the barge would be considerably less than this value, therefore it can be concluded total project emissions would be well under 25,000 metric tons CO2-equivelent and further detailed greenhouse gas emissions analysis is not warranted if in-water construction is utilized.

Impacts from GHG emissions during construction are expected to be localized, minor, and short-term (no long term effect to air quality). Mitigation measures would further offset project GHG emissions and the project would have short-term, minor releases during construction. No long-term emissions of GHGs are anticipated.

11.2.5.1.4 Summary of Impacts to the Physical Environment

Impacts to the physical environment from implementation of the Shell Belt and Coden Belt Roads Living Shoreline Project would include:

- Short term, minor, adverse impacts to geology and substrates due to disturbance from the placement of hard, structural material over soft bottom and long-term benefits to the bottom substrates due to stabilization of sediments by hardened reef structures, as well as long-term benefits to the shoreline from reduction in erosion.
- No impacts to floodplains or hydrology would occur. Short term minor impacts to water quality would result from increased turbidity during material placement with long term beneficial

impacts as the reefs are expected to contribute to localized water quality improvement due to the filtration capacity of oysters and other bivalves that would be anticipated to colonize the reefs. Long-term beneficial impacts would also occur from the breakwater protection of wetlands.

- Minor short-term adverse impacts to air quality and GHG emissions would result from the use of construction equipment. Impacts would be localized and last only during the construction period.

11.2.5.2 Biological Environment

Alabama is ranked fifth in the nation for biodiversity, with a total of 4,533 different plant and animal species (Stein 2002). This distinction is mainly a result of the relatively high number of species of freshwater fish (297), marine animals (250), reptiles (85), amphibians (68), and vascular plants (2,902). This incredible species richness includes 144 endemic species, or organisms found only in the state of Alabama. The coastal ecosystems of Mobile Bay and Mississippi Sound provide valuable habitat to a large percentage of our diverse floral and faunal populations (MBNEP 2008).

The Mississippi Sound system supports an array of biological communities and species characteristic of a northern Gulf of Mexico estuary. Estuarine habitats include tidal flats, benthic microalgae communities, sea grass beds, oyster beds, tidal marshes, planktonic communities, and pelagic communities.

11.2.5.2.1 Living Coastal and Marine Resources

Living coastal and marine resources with the potential to be affected by the proposed action include: SAV; benthos, invertebrates and fish; essential fish habitat (EFH); marine mammals; terrestrial species; and threatened and endangered species. The affected environment and impacts for each of these resources under the proposed action is discussed individually below. Overall impacts to living coastal and marine resources for the no action and proposed action are summarized here.

No Action

Under the no action alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to living coastal and marine resources would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Sections 6.3.2 and 6.7.6.1 of the Final Phase III ERP/PEIS describe the impacts to living coastal and marine resources for all topics discussed below (SAV; benthos, invertebrates and fish; EFH; marine mammals; terrestrial species; and threatened and endangered species) from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that placement of breakwaters and living shorelines would provide long-term benefits by protecting eroding wetlands and shallow water habitats and, in some cases, would allow for additional wetlands and shallow water

habitat creation on the shore side of the constructed breakwaters. These actions would provide long-term benefits to benthic populations, pelagic microfaunal communities, and finfish, by increasing habitat and foraging areas.

Placement of breakwaters and living shorelines could require use of in-water heavy equipment and sediment placement, which would increase human activity, noise, vibration, and turbidity in the short-term. These activities could result in short-term, mostly minor, adverse impacts to species in the area from displacement and mortality of individual species. Long-term moderate impacts are possible due to displacement of sea turtles and shorebirds. For this project, impacts to living coastal and marine resources were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

Potential mitigation measures for impacts to each of the living and coastal marine resource categories discussed below are in Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would be implemented as part of this action include:

- Use of existing access ways whenever possible. Temporary access roads would not be built in locations that would suggest a likelihood of excessive erosion (e.g., large slopes, erosive soils, proximity to water body). All temporary access roads would be restored when the action is completed, the soil would be stabilized, and the site would be re-vegetated. .
- Maintenance of generators, cranes, and any other stationary equipment operated within 150 feet of any natural or wetland area as necessary to prevent leaks and spills from entering the water.
- Employment of standard BMPs for construction to reduce erosion.
- Development and implementation of spill prevention and control plans to minimize the risk of release of petroleum and oil products into receiving waters.
- Cleaning of construction equipment as needed before moving between sites to prevent spread of invasive species.
- Identification of mooring locations for restoration-related barges and other boats to best avoid EFH and minimize damage to existing healthy reefs.

The potential introduction of terrestrial and aquatic non-native invasive species of plants, animals, and microbes is a concern for any proposed project. Non-native invasive species could alter existing terrestrial or aquatic ecosystems, may cause economic damages and losses, and are the second most common reason for protecting species under the Endangered Species Act. The species that are or may become introduced, established, and invasive are difficult to identify. The analysis focuses on pathway control or actions/mechanisms that may be taken or implemented to prevent the spread of invasive species on site or introduction of species to the site. Surveys have not been conducted to determine if invasive species are present.

This project involves placement of artificial breakwater material. A variety of in-water construction equipment would be used. Each of these actions and pieces of equipment serve as a potential pathway to introduce or spread invasive species. BMPs would be implemented to ensure these pathways are

"broken" and do not spread or introduce species (See BMPs listed below). The implementation of these BMPs meets the spirit and intent of EO 13112. Due to the implementation of BMPs, the Trustees expect risk from invasive species introduction and spread to be short-term and minor.

The Phase III ERP/PEIS provided mitigation measures in Appendix 6A. The following mitigation measures and environmental review would result in the avoidance and minimization of the introduction and spread of invasive species:

- All equipment to be used during the project, including personal gear, would be inspected and cleaned such that there is no observable presence of mud, seeds, vegetation, insects and other species.
- Breakwater habitat material would be treated or inspected to remove "non-target" species.
- Cleaning of construction equipment as needed before moving between sites to prevent spread of invasive species.

Submerged Aquatic Vegetation

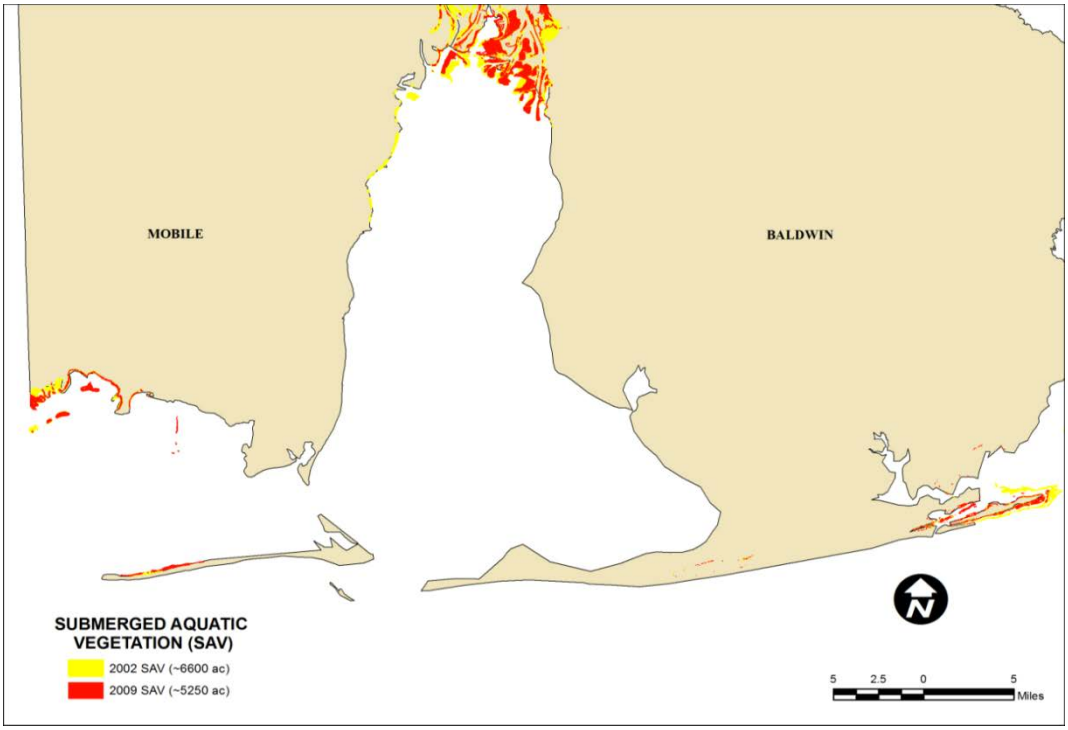
Affected Resources

Submerged aquatic vegetation consists of rooted vascular plants that grow in fresh, brackish, and saltwater. These beds of SAV provide important foraging grounds and habitats for many species in the Gulf of Mexico. No formal SAV survey has been performed for the project area. However, SAV in the Mobile Bay and the Mississippi Sound were systematically evaluated using aerial photographs in 2002, 2004, and 2009. Results of these surveys indicate that there are no known SAV beds in the vicinity of Shell Belt and Coden Belt Roads (Vittor and Associates 2009), see Figure 11-4. Earlier SAV inventories of Mobile Bay (Stout et al. 1982; USACE 1985) identified as many as 20 species of SAV occurring in the shallow shoreline areas of Mobile Bay. Data show that through the 1960s and 1970s, grassbeds in the bay have steadily declined. Historically, a combination of changes has occurred to produce a decline in submerged grassbeds in Mobile Bay. Recent studies of SAV coverage in Mobile Bay have been conducted by the Mobile Bay National Estuary Program and ADCNR. Results of these coverage studies indicate that between 2002 (the first mapping date) and 2009, SAV coverage in Mobile Bay has continually declined. However, during that same time, coverage in lower Perdido Bay increased and there were large scale fluctuations in coverage in Mississippi Sound (Vittor and Associates 2009).

The largest factor contributing to SAV decline in Mobile Bay is ambient water quality, specifically nutrients and turbidity. Turbidity can be defined as muddiness created by stirring up sediment or having foreign particles suspended in the water column. The turbid water commonly seen in Mobile Bay due to its shallow depth and high suspended sediment load (4.85 million metric tons per year), which represents turbidity caused by both natural and anthropogenic factors. Turbidity negatively affects SAV by reducing light penetration through the water column. Stormwater runoff contributes to high turbidity levels by delivering sediments into the water column and providing nutrients that stimulate algae growth.

Over-enrichment of nutrients (particularly nitrogen) comes from the use of agricultural and household fertilizers on fields and lawns as well as waste from wild and domestic animals. Other human activities detrimental to SAV survival include recreational and commercial boating which causes a re-suspension of sediments (increase in turbidity) from propellers and boat wakes along bay edges. Further, grounding of outboard motor props rips sea grass and harm rhizomes, leaving behind "prop scars" that can take three to five years to recover (MBNEP 2008). Some other human activities impacting SAV growth include commercial and recreational trawling, which disturbs the substrate in which the plants grow and increases turbidity by stirring up sediments, and deposition of dredged materials (MBNEP 2008).

Figure 11-4. Submerged Aquatic Vegetation distribution between 2002 and 2009



Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to SAV would occur. Beneficial impacts from the placement of breakwaters which would enhance habitat would not occur.

Proposed Action

Given that there are no SAV in the project area, potential adverse effects to SAV are not expected.

Benthos, Invertebrates, and Fish

Affected Resources

Vittor and Associates, Inc. (1982) named several opportunistic benthic species that are ubiquitous near the Gulf of Mexico's shores. These species, though sometimes low to moderate in abundance, occur in a wide range of environmental conditions. They are usually the most successful at early colonization and thus tend to strongly dominate the sediment after disturbances. These species include bristleworm (*Mediomastus spp.; Myriochele oculata; Sigambra tentaculata; Linopherus-Paraphinome; Magelona cf. phyllisae*), Fringe-gill Mudworm (*Paraprionospio pinnata*), Owenia worm (*Owenia fusiformis*), and Lumbrineris worm (*Lumbrineris spp.*). Bristleworm and Owenia worm are the predominant genera in Mississippi Sound.

Data collected between 1981 and 2003 concerning selected species such as brown shrimp (*Penaeus aztecus)*, white shrimp (*Penaeus setiferus*), pink shrimp (*Penaeus duararum*), blue crab (*Callinectes sapidus*), lesser blue crab (*Callinectes similis*), hardhead catfish (*Arius felis*), Gulf butterfish (*Peprilus berti*), white trout (*Cynoscion arenarias*), Gulf menhaden (*Brevooria patrouis*), spot (*Leiostomus xanthurus)*, and Atlantic croaker (*Micropogonias undulatus*) were evaluated to summarize species status, to identify species requiring additional management, and to make recommendations to increase their abundance (Valentine et al. 2006). In 2008, another statistical analysis of the Fisheries Assessment and Monitoring Program data sets from 1981 through 2007 was completed (Riedel, et al. 2010). Both studies were in agreement that, for most species, no significant changes in abundance were revealed over this time frame with notable exceptions for brown shrimp and blue crabs.

The eastern oyster (*Crassostrea virginica*) is the primary oyster species found in the Gulf and is a major commercial species. Oysters are important as both organisms and habitat with an integral role in the functioning of the ecosystem. In the Gulf of Mexico, oysters are distributed throughout the coastal area and are found in higher abundance in near-shore, shallow, semi-enclosed water bodies, close to freshwater sources (OTTF 2012). The majority of oysters are found off of Louisiana, followed by Florida, Texas, and Mississippi. Alabama has the lowest density of oysters in the Gulf of Mexico. Oyster reefs in Alabama are, however, important to the Mobile Bay and Mississippi Sound ecosystems as they remove excess nutrient and suspended particles from the water column.

Numerous fish species occur in the project area with the most common including: Atlantic croaker (*Micropogonias undulatus*), spot (*Leiostomus xanthurus*), bay anchovy (*Anchoa mitchilli*), and Gulf menhaden (*Brevoortia patronus*) (Swingle 1971; Riedel et al. 2010).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to benthos, invertebrates and fish would occur. Beneficial impacts from the placement of breakwaters which would enhance habitat would not occur.

Proposed Action

Potential adverse effects to benthic organisms, invertebrates, and fish may occur during construction activities such as breakwater placement; however, these effects would be short term, localized, and minor. The project may reduce habitat utilization by species in the area, as most mobile invertebrates and fishes would likely avoid the project area during the construction process. There would be no change in the diversity or local populations of marine and estuarine species. Disturbances would not interfere with key behaviors such feeding and spawning. There would be no restriction of movements daily or seasonally.

Following construction, there is expected to be increased habitat utilization of the breakwaters and near-shore environment by these species and a beneficial, long-term impact is anticipated.

Essential Fish Habitat

Affected Resources

Essential Fish Habitat is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity" (16 U.S.C. § 1802(10)). The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments (see Figure 11-5). These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. EFH components that exist within the project area include emergent wetlands, mud substrate, and estuarine water columns.

The 1996 amendments to the MSFCMA set forth a mandate for NMFS, regional Fishery Management Councils (FMC), and other Federal agencies to identify and protect EFH of economically important marine and estuarine fisheries. To achieve this goal, suitable fishery habitats need to be maintained and restored. A provision of the MSFCMA requires that FMCs identify and protect EFH for every species managed by a Fishery Management Plan (FMP) (U.S.C. 1853(a)(7)). There are FMPs in the Gulf region for shrimp, red drum, reef fishes, coastal migratory pelagics, and highly migratory species (e.g., sharks).

During the process of analyzing, identifying, and describing EFH for each managed species, the Gulf Council refined their designations by establishing five "eco-regions." Within each eco-region, EFH was further defined as occurring either in estuarine (inside barrier islands and estuaries), nearshore (waters less than 18-meters/60-feet deep) or offshore waters (greater than 18-meters/60-feet deep). The proposed project is within Eco-region 3, which extends from Pensacola Bay, Florida, to the Mississippi River Delta. The restoration activities would be located within estuarine waters of Mississippi Sound.

EFH within estuaries is defined as, "all estuarine waters and substrates (mud, sand, shell, rock and associated biological communities), including the sub-tidal vegetation (grasses and algae) and adjacent inter-tidal vegetation (marshes and mangroves)," (*Generic Amendment Number 3 for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico, Gulf of Mexico Fishery Management*

Council, *March 2005*). Estuarine habitats such as shallow waters, submerged aquatic vegetation, emergent marshes, mangroves, oyster reefs, and unvegetated soft bottom substrates all provide EFH for multiple fish species managed by the Gulf Council that inhabit the estuary for part of their life cycle. Table 11-2 summarizes EFH categories for estuarine waters within Eco-region 3 within the vicinity of the proposed project.

Figure 11-5. Essential Fish Habitat in the Gulf of Mexico

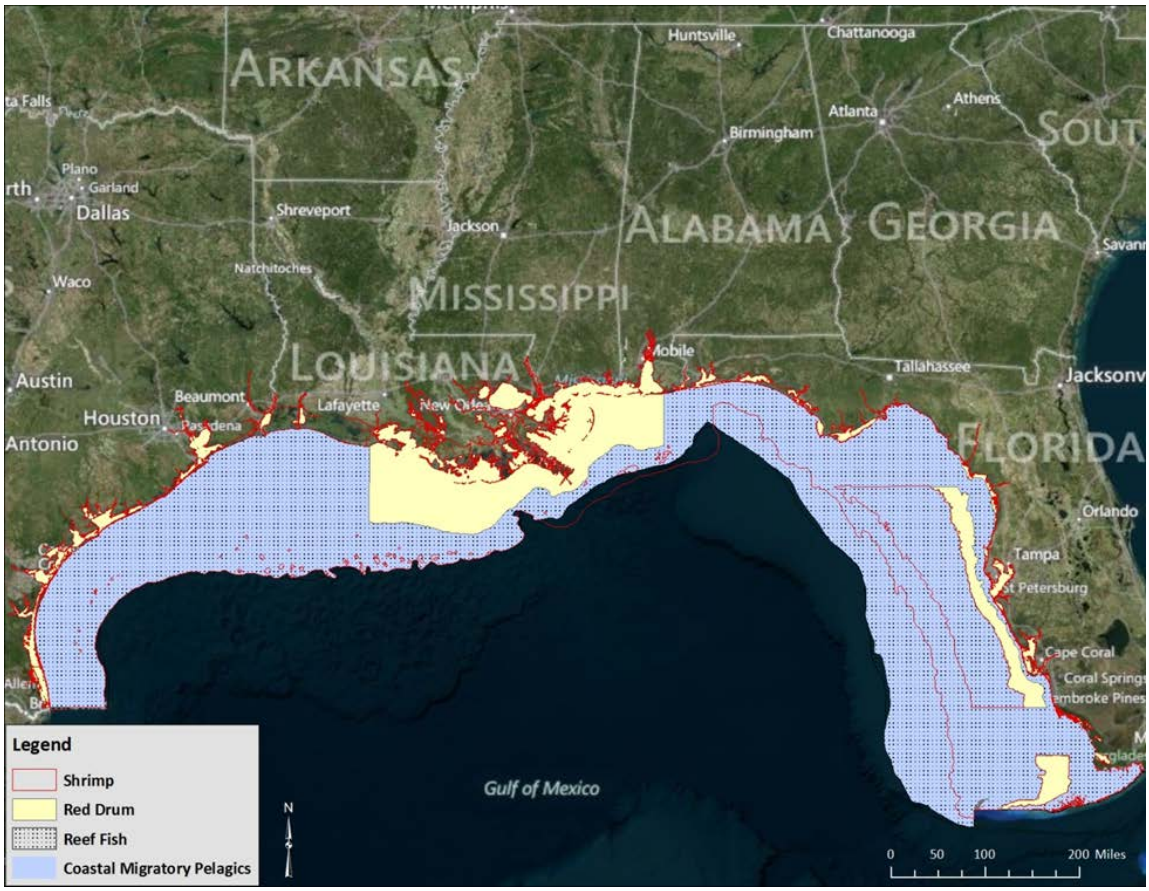


Table 11-2. Estuarine Habitats for Gulf Council Managed Species Within Eco-Region 3 Present Near the Project Site

(● indicates habitat type designated as EFH for species' life stage)

Estuarine Emergent Marsh							
Species Common Name	**Eggs**	**Larvae**	**Post Larvae**	**Early Juvenile**	**Late Juvenile**	**Adult**	**Spawning Adult**
Red Drum			●	●		●	
Gray Snapper						●	
Brown Shrimp				●			
White Shrimp				●			
Estuarine Submerged Aquatic Vegetation							

Species Common Name	Eggs	Larvae	Post Larvae	Early Juvenile	Late Juvenile	Adult	Spawning Adult
Red Drum		●	●		●	●	
Lane Snapper			●	●	●		
Brown Shrimp				●			
Pink Shrimp				●			
Estuarine Pelagic							
Species Common Name	**Eggs**	**Larvae**	**Post Larvae**	**Early Juvenile**	**Late Juvenile**	**Adult**	**Spawning Adult**
Spanish Mackerel				●	●	●	
Estuarine Oyster Reef							
Species Common Name	**Eggs**	**Larvae**	**Post Larvae**	**Early Juvenile**	**Late Juvenile**	**Adult**	**Spawning Adult**
Brown Shrimp				●			
Estuarine Sand and Shell Bottom							
Species Common Name	**Eggs**	**Larvae**	**Post Larvae**	**Early Juvenile**	**Late Juvenile**	**Adult**	**Spawning Adult**
Red Drum			●			●	
Gray Snapper						●	
Lane Snapper				●	●		
Brown Shrimp				●			
Estuarine Mud/Soft Bottom							
Species Common Name	**Eggs**	**Larvae**	**Post Larvae**	**Early Juvenile**	**Late Juvenile**	**Adult**	**Spawning Adult**
Red Drum		●	●	●		●	
Gray Snapper						●	
Lane Snapper				●	●		
Brown Shrimp				●			
White Shrimp				●			

The NMFS manages the highly migratory species (HMS), such as tunas, billfish, and sharks, within EEZ and state territorial waters and provides the EFH designations for HMS. The EFH designations for HMS are primarily based on limited available species distribution data, which led NMFS to identify geographic areas as EFH rather than specific habitat types typically identified in the Gulf Council designations .

HMS managed by NMFS with EFH located within Eco-region 3 in Mississippi Sound within the vicinity of the proposed project are included in Table 11-3 below.

Table 11-3. Highly Migratory Species EFH Designations – State Waters of Eco-Region 3 within the Project Area

Species Common Name	Life Stage Within Estuarine Waters
Hammerhead Shark	Neonate, Juvenile & Adult
Scalloped Hammerhead Shark	Neonate, Juvenile & Adult
Blacktip Shark	Neonate, Juvenile & Adult
Bull Shark	Neonate, Juvenile & Adult
Spinner Shark	Juvenile
Tiger Shark	Juvenile
Bonnethead Shark	Neonate, Juvenile & Adult
Atlantic Sharpnose Shark	Neonate, Juvenile & Adult
Finetooth Shark	Neonate, Juvenile & Adult

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to EFH would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Construction activities and equipment noise associated with construction may temporarily reduce habitat utilization by EFH species in the immediate area. These effects would be short term, localized, and minor. Because the proposed project footprint itself is located in unvegetated open water soft bottom habitat, there would be no adverse impacts to wetlands, seagrasses, or oyster reef habitats. Minor spatially limited adverse effects to EFH would occur within the direct footprint of the breakwater due to the conversion of 0.55 acres of estuarine soft bottom habitat to hard substrate habitat. However, hard substrate habitat and oyster reef habitat created by the breakwater would also directly provide estuarine benthic habitat diversity and EFH benefits to federally managed species such as brown shrimp, red drum, gray and red snapper which utilize shell bottom and oyster reef habitats.

Indirect adverse impacts are not expected in the short or longer term. Once the proposed project is complete, beneficial indirect effects on water quality are expected as a result of increased filtration capacity from the newly established bivalves (Coen et al. 2007). Oysters and other bivalves can also indirectly enhance EFH by offsetting the effects of coastal nutrient loading (Dalrymple 2013), potentially reducing the frequency and magnitude of hypoxia and fish kills. Additionally, oyster and other bivalves have been shown to indirectly promote SAV colonization, which may further enhance EFH, due to sediment stabilization and increased water clarity (Meyer et al. 1997).

ADCNR, in consultation with the contractors, would take all practicable precautions to avoid and minimize negative impacts to EFH. The following BMPs would be implemented specific to minimization of impacts to EFH resources:

- BMPs would be implemented during construction to reduce impacts from project implementation. Contractors would access the site with shallow draft vessels during tide levels which are sufficient to avoid prop washing. Contractors would be notified of the location of seagrasses inland of the proposed project footprint and would be instructed not to enter seagrass beds during construction.

- The contractor would follow the USFWS standard manatee construction conditions and standard sea turtle and smalltooth sawfish conditions, as required under Endangered Species Section 7 consultations. The construction procedures outlined in these documents require boats to operate at idle speed and ensure that contractors visually assess the construction area for manatees and sea turtles. Following these guidelines would also help minimize potential prop dredging, and subsequent bottom disturbance, and would help minimize impacts to individual fish species.
- Monitoring would be conducted before, during, and after project implementation to ensure compliance with project design. If immediate post-construction monitoring reveals that unavoidable impacts to EFH have occurred, appropriate coordination with regional EFH personnel would take place to determine appropriate response measures, possibly including mitigation.

Marine Mammals

Affected Resources

Marine mammals found in the Gulf of Mexico include 21 species of cetaceans (whales and dolphins) and the West Indian manatee (*Trichechus manatus*). Two species commonly occur at nearby Gulf Islands National Seashore and Mobile Bay and may therefore occur in the waters surrounding the proposed project area: the bottlenose dolphin (*Tursiops truncates*) and the Atlantic spotted dolphin (*Stenella frontalis*). The West Indian manatee will be discussed in the section on threatened and endangered species.

Dolphin Species

The bottlenose dolphin and the Atlantic spotted dolphin are the two most common marine mammals found in the Gulf of Mexico. Both species feed primarily on fish, squid and crustaceans. While the Atlantic spotted dolphin spends the majority of its life offshore, the bottlenose dolphin often travels into coastal bays and inlets for feeding and reproduction.

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to marine mammals would occur. Beneficial impacts

from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Environmental Consequences

Potential minor adverse effects due to noise, prey availability, and turbidity associated with breakwater placement may temporarily disturb certain dolphin species in the vicinity of the project area. However, the mobility of these species reduces the risk of injury due to construction activity. Furthermore, the short duration of construction activities, localized nature of the project and best management practices would prevent take of dolphins.

11.2.5.2.2 Terrestrial Species

Vegetation

Affected Resources

The coastal land cover near Shell Belt and Coden Belt Roads consists mainly of fragmented development (e.g. open space, low intensity), barren land, and emergent herbaceous wetlands (MRLCC 2015). The low intensity development consists of a mixture of constructed materials—mainly single family homes—and vegetation where impervious surfaces account for 20-49 percent of the land. Barren land is characterized by bare rock, gravel, sand, silt, clay, or other earthen material, with little or no "green" vegetation present regardless of its inherent ability to support life. Vegetation, if present, is more widely spaced and scrubby than grassland or forested communities; furthermore, lichen cover may be extensive. Finally, emergent herbaceous wetlands are areas where perennial herbaceous vegetation accounts for 80 percent of the cover and the soil or substrate is periodically saturated or covered with water. Emergent wetlands include marshes, meadows, and fens.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to vegetation would occur.

Proposed Action

Sparse patches of grass exist on the barren land between Shell Belt Road, Coden Belt Road and Portersville Bay. Since construction equipment would be operating and constructing the breakwater units from the ROW or from open water, potential adverse effects to terrestrial vegetation are expected to be short-term, localized, and minor.

Birds

Affected Resources

Many species of birds spend all or a portion of their life cycle along the Gulf of Mexico using a variety of habitats at different stages. Major groups of birds that use habitats throughout the northern Gulf of Mexico include: waterfowl and other water-dependent species, pelagic seabirds, raptors, colonial waterbirds, shorebirds, secretive marsh birds, and passerines.

Many bird species migrate between breeding and wintering habitat and, upon reaching the Gulf Coast, migrate east-west along the northern Gulf Coast and/or cross the Gulf of Mexico each fall and spring. Central, Mississippi, and Atlantic Flyways are used by millions of birds that converge on the Gulf Coast where they either migrate along the northern Gulf Coast before reaching their destination on the Gulf of Mexico; follow the Mexico-Texas coastline; or cross the Gulf of Mexico between Mexico's Yucatan Peninsula and the Texas Coast (trans-Gulf migrants) (TPWD 2015). The groups of bird species utilizing habitats within vicinity of Shell Belt and Coden Belt Roads are described below in Table 11-4.

Table 11-4. Groups of bird species utilizing habitats within the vicinity of Shell Belt and Coden Belt Roads

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Waterfowl (geese, swans, ducks, loons, and grebes)	Foraging, feeding, resting, and roosting	Waterfowl forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily roost and nest in low vegetation.
Other water birds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, and roosting	These birds forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily roost outside of the project area.
Raptors (osprey, hawks, eagles, owls)	Foraging, feeding, and resting	Raptors forage, feed, and rest in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. Most raptors are aerial foragers and soar long distances in search of food. The project is expected to improve foraging habitat for raptors.

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Colonial Wading birds (herons, egrets, ibises, American flamingo)	Foraging, feeding, and resting	Wading birds primarily forage and feed at the water's edge. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily nest and roost in trees or shrubs (e.g. pines, *Bacchurus* and mangroves), which occur outside the project area. In addition, this project is likely to improve shoreline habitat conditions and near-shore habitat.
Shorebirds (plovers, oystercatchers, stilts, sandpipers)	Foraging, feeding, resting, and roosting	Shorebirds forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily nest or roost outside the immediate area of disturbance.
Marsh birds (passerine species; grebes, bitterns, rails, gallinules, and limpkin)	Foraging, feeding, resting, and roosting	Marsh birds forage, feed, rest, and roost in the vicinity of the project area. As such, they may be impacted locally and temporarily by the project. However, it is expected that they would be able to move to another nearby location to continue foraging, feeding and resting if disturbed by the project.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 U.S.C. §§ 703 *et seq.*) makes it "unlawful at any time, by any means or in any manner, to […] take, capture, kill, attempt to take, capture, or kill, possess, […] ship, […] transport or cause to be transported […] any migratory bird, any part, nest, or egg of any such bird." The MBTA applies to migratory bird species that occur in the United States as the result of natural biological or ecological processes. Over 800 species of birds occurring in the United States are protected under the MBTA.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to birds would occur.

Proposed Action

The MBTA requires the protection of all migratory bird species and protection of ecosystems of special importance to migratory birds against detrimental alteration, pollution, and other environmental degradation.

The project would have a minor, short term impact to birds during construction due to elevated noise levels and presence and operation of equipment. Given the small project footprint and the species' mobility, any species foraging within the project area during construction would be able to avoid direct impacts. Potential effects to prey resources may occur during construction; however, these would be minor and temporary.

The proposed action would result in minor, short-term, localized adverse impacts to transient bird individuals during construction, but these species are mobile and would likely exit the area during construction (no impacts to overall population). If nesting birds are observed during project construction, the USFWS would be contacted to determine if BMPs are necessary to avoid take. The Trustee would implement any BMPs such that the proposed action would not result in take under the MBTA. The proposed action would have a long-term minor beneficial impact due to increasing habitat for juvenile finfish and shellfish as a source of food for shorebirds and wading birds. The proposed action would not result in indirect impacts to birds.

Mammals

Affected Resources

North American River Otter

The North American river otter (*Lontra canadensis*) is a member of the weasel family. River otters are found in a variety of freshwater habitats including rivers, streams and marshes. Their home ranges can be as small as 5 miles and as large as 40 since they are able to travel over land to reach water sources. They typically feed on a variety of fish, freshwater mussels, crayfish, frogs, snakes, and turtles. North American river otters build dens in the burrows of other mammals, in natural hollows, such as under a log, or in riverbanks. Dens have underwater entrances and a tunnel leading to a nest chamber that is lined with leaves, grass, moss, bark, and hair (NatureServe 2015).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to mammals would occur.

Proposed Action

Potential adverse effects from noise and other activity associated with construction could temporarily disturb river otters; however, it is unlikely that this species would be present in the construction area as

it is saltwater. River otters would more likely be found in Bayou la Batre and Bayou Coden; therefore, impacts to river otters are not anticipated.

Reptiles

Affected Resources

Diamondback Terrapins

Diamondback terrapins (*Malaclemys terrapin*) are believed to be the only turtle in the world that lives exclusively in brackish water habitats (e.g., tidal marshes, estuaries, and lagoons). The species primarily forages on fish, invertebrates (e.g. snails, worms, clams, crabs), and marsh grass. Nesting for the species occurs in sandy beach and/or shell habitats. Terrapin hatchlings emerge from August to October. Only 1 to 3 percent of the eggs laid produce a hatchling, and the number of hatchlings that survive to adulthood is believed to be similarly low (Defenders of Wildlife 2011). Most terrapins hibernate during the winter by burrowing into the mud of marshes. Decreases in terrapin populations have been documented throughout their range due to interactions with commercial crab/lobster industries, coastal development and incidental injury from motorboats (ADCNR 2010). It is for these reasons that diamondback terrapins have received "species of special concern" status in many states including Alabama.

American Alligators

American alligators (*Alligator mississippiensis*) are an important part of the environment; not only do they control populations of prey species, they also create peat and "alligator holes," which are invaluable to other species (Britton 1999). Alligators are known to dig holes in mud where water fluctuates to provide protection from heat. These animals are carnivores that feed on anything; they eat fish, snails, birds, frogs, turtles, and mammals near the water's edge (Schechter and Street 2000). Although they are primarily freshwater animals, alligators will also venture into brackish salt water (Savannah River Ecology Laboratory 2012). Their populations have increased as a result of strict conservation measures, but alligator habitat is still being destroyed. Alligators are good indicators of environmental factors, such as toxin levels − increased levels of mercury have been found in alligator blood samples (Britton 1999). The first few years of an alligator hatchling's life are the most dangerous, as they are preyed upon by snakes, wading birds, osprey, raccoons, otters, large bass, and garfish (Schechter and Street 2000). Alligators are hunted for their skin, which is commercially used for wallets, purses, boots, and other consumer goods (Schechter and Street 2000). Alligators are also raised in captivity for the production of their meat and skin, resulting in a multimillion dollar industry (Schechter and Street 2000). In addition, alligators are a tourist attraction, especially in Florida (Schechter and Street 2000).

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to reptiles would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Potential minor adverse effects due to noise and other activity associated with breakwater placement may temporarily disturb diamondback terrapin and alligators that are in the project area. Construction activities may also temporarily increase the potential for boat collisions with these species; however, contractors would operate their vessels at idle/no wake speed during construction activities as required by the Marine Mammal Protection Act. The mobility of both the alligator and diamondback terrapin reduces the risk of injury due to construction activity. Furthermore, the short duration of construction activities and localized nature of the project would aid in preventing incidental take of reptiles.

11.2.5.2.3 Threatened and Endangered Species

Birds

Affected Resources

Three Federally listed bird species, wood stork (*Mycteria americana*), piping plover (*Charadrius melodus*), and red knot (*Calidris canutus rufa*) are known to occur in Mobile County, Alabama.

The wood stork (*Mycteria americana*) is a threatened species originally listed by USFWS in 1984. The wood stork is the largest wading bird breeding in the United States and is typically associated with freshwater habitats and prefers swamps, coastal shallows, ponds, and flooded pastures (Stokes 1996). During times of drought, depressions in brackish marshes become important habitat components. Wood storks are residents of the Southeast specifically along the Gulf Coast from Texas to Florida. This species does not have a breeding population within the state of Alabama (USFWS 2007), but non-breeding transient individuals may be present in summer and early fall in the western inland Coastal Plain near the Tombigbee River, lakes in Hale, Marengo, and Perry Counties, and at ponds near Montgomery. The Shell Belt and Coden Belt Roads Living Shoreline Project would not impact any habitat typically used by the wood stork. Wood Storks are not known to forage in the project area and there are no known wood stork breeding colonies or roost sites within close proximity of the project area.

The piping plover is a small North American shorebird with three distinct populations that breed in the Great Lakes, the Northern Great Plains and the Atlantic Coast. The Atlantic Coast population breeds from North Carolina to Newfoundland and winters in the Caribbean and along the Atlantic and Gulf Coasts. Piping plovers typically utilize sand beaches, mixed sand and gravel beaches and exposed sandy tidal flats. In Alabama, critical habitat for piping plovers is largely limited to the Gulf barrier islands. Piping plover has designated critical habitat near the project area at Isle aux Herbes (unit AL-1) and

Dauphin Island (unit AL-2). Unit AL-1 is at least a mile from any project activity and Unit AL-2 is at least nine miles from any project activity.

The PCEs for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support these habitat components. The PCEs are found in geologically dynamic coastal areas that support intertidal beaches and flats (between annual low tide and annual high tide) and associated dune systems and flats above annual high tide. Additional information on each specific unit included in the designation can be found at 66 FR 36038. PCEs of wintering piping plover critical habitat include:

1) Intertidal flats with sand or mud flats (or both) with no or sparse emergent vegetation.

2) Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers. Such sites may have debris, detritus, or microtopographic relief (less than 50 cm above substrate surface) offering refuge from high winds and cold weather.

3) Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas.

4) Washover areas are broad, unvegetated zones, with little or no topographic relief, that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action.

Activities that affect PCEs include those that directly or indirectly alter, modify, or destroy the processes that are associated with the formation and movement of barrier islands, inlets, and other coastal landforms. Those processes include erosion, accretion, succession, and sea-level change. The integrity of the habitat components also depends upon daily tidal events and regular sediment transport processes, as well as episodic, high-magnitude storm events (Service 2001b).

Between 1981 and 2014, piping plover sightings in Mobile and Baldwin counties indicate that there is an average high count of approximately 8 individuals occurring in March and an average low count of less than 1 individual occurring in June (eBird 2015).

The red knot is the largest of the stints in North America. It is a medium-sized, bulky bird with a short, straight, black bill. The red knot makes one of the longest yearly migrations of any bird, as breeding occurs in the high Arctic and most wintering occurs in South America. In Alabama, the red knot is rare as it migrates through the area between its breeding and wintering habitats. Red knots can winter along the Gulf coast and, when present, they are typically found in mudflats and along sandy shores.

Bald and Golden Eagle Protection Act

The bald eagle (*Haliateetus leucocephalus*) is no longer protected under the ESA as the species has achieved recovery. The bald eagle is, however, protected by the U.S. government under the Bald and

Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles occur most commonly in areas close to coastal areas, bays, rivers, lakes, or other bodies of water that provide concentrations of food sources, including fish, waterfowl, and wading birds. Usually, the bald eagle nests in tall trees (mostly live pines) that provide clear views of surrounding area. In the Southeast, bald eagles typically nest between September and May.

Suitable habitat for the bald eagle is likely present between the shoreline and the proposed project site. However, occurrences of bald eagles in Mobile County are very low (ebird 2015). In the last fifty years, bald eagle counts have averaged between zero and two individuals annually (ebird 2015).

Environmental Consequences

No Action

Under the no action alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to threatened and endangered birds would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Potential adverse effects to threatened birds would be minimal and include elevated noise levels and the presence of breakwater construction equipment. These species are mobile and would likely exit the area during construction (no impacts to overall population). Therefore, adverse effects would be short term, localized, and minor. Land based-deployment is the preferred method for WAU placement. Therefore, it is anticipated that all impacts to birds would be related to the use and presence of land-based construction equipment. Although not anticipated, if it is determined that in-water work would be necessary, BMPs would be implemented to mitigate any potential impacts to threatened and endangered birds.

Piping plover and red knot may use nearby shoreline habitats for resting or foraging during winter months. Potential impacts to these species could include elevated noise levels during project construction. However, given the fact that the project site is bordered by a seawall and riprap, it is unlikely that these species forage in this area. Therefore any impacts to piping plovers and red knot are unlikely and/or would be short-term, localized, and minor.

The nearest designated critical habitat for piping plover is located at Isle aux Herbes (unit AL-1) and Dauphin Island (unit AL-2). Unit AL-1 is approximately one mile from any project activity and Unit AL-2 is approximately 9 miles from any project activity. Given this distance, noise from land-based construction equipment would not likely impact piping plover critical habitat. Land based-deployment is the preferred method for WAU placement. However, although not anticipated, if it is determined that in-water work would be necessary, construction barges, tugs and other watercraft would most likely be staged in either Bayou la Batre and/or Coden, and associated watercraft would have no reason to be in close proximity to either critical habitat unit. Given predominant wave direction and current in

Portersville Bay, and the distance to Units Al-1 and AL-2, the breakwaters would have no impacts on either unit. Therefore, no impact to piping plover critical habitat is anticipated.

Wood Storks are not known to forage in the project area and there are no known wood stork breeding colonies or roost sites within close proximity of the project area. Therefore no effect on this species is expected.

Land based-deployment is the preferred method for WAU placement and in-water work is not anticipated. However, if it is determined that in-water work would be necessary, best management practices would include:

- Conducting construction activities outside of nesting season, if nests are present; if a nest is present and it is not possible to avoid construction, maintain a buffer of at least 660 feet from the nest; and,
- Minimize the number of boat trips passing within 660 feet of the nest location.

No bald eagle nests are currently documented within close proximity to the project area. Pre-construction surveys would be conducted for bald eagle nests. If bald eagle nests are located, Bald and Golden Eagle Protection Act best management practices would be followed to minimize harm to bald eagles.

Fish

Affected Resources

Gulf Sturgeon

The NMFS and USFWS listed the Gulf sturgeon (*Acipenser oxyrinchus)* as a threatened species on September 30, 1991. The Gulf sturgeon, also known as the Gulf of Mexico sturgeon, is a subspecies of the Atlantic sturgeon. Adults are 180 to 240 cm (71-95 inches) in length, with adult females larger than adult males. Adult fish are bottom feeders, eating primarily invertebrates, including brachiopods, insect larvae, mollusks, worms and crustaceans. The Gulf sturgeon is an anadromous fish that migrates from salt water into coastal rivers during the warmer months to spawn. The sturgeon often stays in the Gulf of Mexico and its estuaries and bays in cooler months (NMFS 2013). Most adult feeding takes place in the Gulf of Mexico and its estuaries. The fish return to breed in the river system in which they hatched. Spawning occurs in areas of deeper water with clean (rock and rubble) bottoms. The eggs are sticky and adhere in clumps to snags, outcroppings, or other clean surfaces. Sexual maturity is reached between the ages of 8 and 12 years for females and 7 and 10 years for males. The Gulf sturgeon historically was threatened because of overfishing and then by habitat loss due to construction of water control structures, dredging, groundwater extraction, and flow alterations.

This portion of Mississippi Sound is not designated as Gulf sturgeon critical habitat; however, USFWS includes the Gulf sturgeon on the list of species likely to occur in Mobile County, Alabama. Sturgeon have been observed, collected, and tagged in the Mobile Bay. Sturgeons were observed using the marine and estuarine waters of the bay, but were not observed moving through the bay toward the

Mobile River or spawning. The tagged sturgeon from Mobile Bay returned to the Choctawhatchee River in Florida (Mettee et al. 2009; NMFS 2013).

Environmental Consequences

No Action

Under the no action alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to threatened and endangered fish would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Potential adverse effects to the Gulf sturgeon include elevated noise levels and the presence of WAU placement equipment. Land based-deployment is the preferred method for WAU placement. It is anticipated that noise from land-based WAU placement equipment would have minimal impacts on Gulf sturgeon. Immediately following WAU placement, turbidity may increase, but impacts would be minimal and short-term. WAU placement would occur in less than five feet of water in areas of silty sand to stiff clay waterbottoms. These shallow waterbottoms are not known to be favored Gulf Sturgeon foraging areas. Additionally, If the work takes place during the spring and summer months, Gulf Sturgeon are not likely to be present in inshore shallow waters. During the winter month daylight hours, because of low winter tides, the project area is extremely shallow, less than one foot deep. If present, Gulf Sturgeon are mobile and would likely exit the area during construction (no impacts to overall population). Some soft bottom habitat would be converted to hard bottom. The use of breakwaters as a living shoreline technique may provide an indirect benefit to Gulf sturgeon by enhancing the diversity of prey available by creating patchwork reefs that, over time, provide more structurally complex habitat for prey species. Throughout the duration of the project, the breakwaters would help mitigate coastal erosion and also encourages nektonic production that could lead to greater prey availability in the immediate project area for Gulf sturgeon.

This project is not taking place within Gulf Sturgeon critical habitat. Potential adverse impacts to gulf sturgeon due to noise from land-based construction activities would be minimal. Land based-deployment is the preferred method for WAU placement. However, although not anticipated, if it is determined that in-water work would be necessary, construction barges, tugs and other watercraft would most likely be staged in either Bayou la Batre and/or Coden, and associated watercraft would have no reason to enter Gulf Sturgeon critical habitat. Therefore, no impact to Gulf Sturgeon estuarine critical habitat is anticipated.

Mammals

Affected Resources

The West Indian Manatee

The West Indian Manatee (*Trichechus manatus*) is listed as endangered under the ESA. The species is endangered due to its small population size (less than 2,500 mature individuals with possible population decline), the possibility of at least a 50 percent future reduction in population size, and near- and long-term threats from human-related activities (USFWS 2010; FFWC 2007). Between October and April, manatees concentrate in areas of warmer water. During summer months, the species may migrate as far west as the Louisiana and Texas coast on the Gulf of Mexico. In Alabama, a number of manatees (one to fifteen individuals) are routinely seen in the calm, shallow waters of rivers and sub-embayments of Mobile Bay and the Mobile-Tensaw Delta. Manatees inhabit both salt and fresh water of sufficient depth (about 5 feet to usually less than 18 feet). Manatees will consume any aquatic vegetation available to them including sometimes grazing on the shoreline vegetation.

Environmental Consequences

No Action

Under the no action alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to threatened and endangered mammals would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Minor adverse impacts due to noise from land-based WAU placement equipment and turbidity associated with WAU placement may temporarily disturb manatees in the vicinity of the project area. However, the mobility of this species reduces the risk of adverse impacts. Furthermore, the short duration of construction activities and localized nature of the project would aid in minimizing impacts and preventing incidental take, including disturbance of manatees. Potential adverse impacts to manatees due to noise from land-based construction activities would be minimal. Land based-deployment is the preferred method for WAU placement. However, although not anticipated, if it is determined that in-water work would be necessary, all construction activities would follow the Standard Manatee Conditions for In-Water Work (USFWS 2011) to minimize impacts to West Indian manatees to an insignificant and discountable level. Because of manatee sightings in Mobile Bay and its tributaries in recent years, extreme care would be taken during construction not to disturb or injure manatees.

Although not anticipated, if in-water work is determined to be necessary for project implementation, best management practices which would be implemented in accordance with the Standard Manatee Conditions for In-Water Work (USFWS 2011) are as follows:

- All vessels associated with the construction project would operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom.
- All vessels would follow routes of deep water whenever possible. Siltation or turbidity barriers would be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment.
- Barriers would not impede manatee movement.
- All in-water operations, including vessels, will be shut down if a manatee(s) comes within 50 feet of the operation.
- Activities would not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation.
- Temporary signs concerning manatees would be posted prior to and during all in-water project activities.

Reptiles

Affected Resources

Snakes

The black pine snake (*Pituophis melanoleucus lodingi*) is a large (48 to 64 inches long) stocky snake and is only proposed for threatened status by the US Fish and Wildlife Service. Its back and belly are uniformly black or dark brown. Faint blotches may be seen on the hindbody or tail (USFWS 2015). The snake has a range that extends from southwestern Alabama, through southern Mississippi, and into southeastern Louisiana. In each of these states it is considered imperiled or critically imperiled, and the U.S. Fish and Wildlife Service proposed the snake for federal listing under the Endangered Species Act on October 10, 2014. The snake is known to occur in Mobile County, largely in upland, open longleaf pine forests with dense herbaceous groundcover (USFWS 2015). The distribution of remaining populations has become highly restricted due to the destruction and fragmentation of the longleaf pine habitat, which has become one the most critically endangered ecosystems in the United States (USFWS 2013). In Alabama, populations occurring on properties managed as gopher tortoise habitat are likely the best opportunities for long-term survival of the black pine snake (USFWS 2013).

The eastern indigo snake (*Drymarchon corais couperi*) is a large (60 to 74 inches) snake with a black and iridescent blue body (USFWS 2015). The chin and throat are reddish or white, and the color may extend down the body (USFWS 2015). The belly is cloudy orange and blue-gray (USFWS 2015). Historically, the eastern indigo snake lived throughout Florida, the coastal plain of southern Georgia, extreme south Alabama, and extreme southeast Mississippi (USFWS 2015). Today the indigo snake survives in Florida and southeast Georgia, and has been extirpated from Alabama and Mississippi (USFWS 2015); therefore, it is extremely unlikely to exist in the project area. The Indigo Snake is often dependent upon the deep burrows dug by the gopher tortoise and uses them as a refuge from extreme temperatures (ADCNR 2015). This restricted habitat is even more isolated by the snake's preference for the interspersion of

wet lowlands like cypress ponds (ADCNR 2015). These preferred areas are usually found where rivers and creeks run thru sand hills habitat (ADCNR 2015).

Turtles and Tortoises

There are five species of sea turtles that are found in the Gulf of Mexico: green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), loggerhead sea turtle (*Caretta caretta*), Kemp's Ridley sea turtle (*Lepidochelys kempii*), and leatherback sea turtle (*Dermochelys coriacea*). All five species are listed under the ESA. The Gulf populations of hawksbill, Kemp's Ridley, and leatherback sea turtles are listed as endangered. Loggerhead (northwest Atlantic distinct population segment) and green (except the Florida breeding population) sea turtles are listed as threatened. In Mobile County, there is also one endangered freshwater turtle, the Alabama red-bellied turtle (*Pseudemys alabamensis*), and one threatened tortoise, the Gopher tortoise (*Gopherus polyphemus*).

Sea turtles in the Gulf (with the exception of the leatherback turtle) have a life history cycle where hatchlings develop in open ocean areas (e.g., continental shelf) and juvenile and adult turtles move landward and inhabit coastal areas. Leatherback turtles spend both the developmental and adult life stages in the open oceanic areas of the Gulf of Mexico (Dow Piniak 2012). Sea turtles nest on low and high energy ocean beaches and on sandy beaches in some estuarine areas. Immediately after hatchlings emerge from the nest, they begin a period of frenzied activity. During this active period, hatchlings move from their nest to the surf, swim, and are swept through the surf zone, and continue swimming away from land for up to several days (NMFS 2013). Once hatchling turtles reach the juvenile stage, they move to nearshore coastal areas to forage. As adults, they utilize many of the same nearshore habitats as during the juvenile developmental stage. Sea turtles utilize resources in coral reefs, shallow water habitat (including areas of seagrasses), and areas with rocky bottoms.

Sea turtles maintain a variety of Gulf habitats including SAV beds and coral reefs. Grazing on SAV by turtles helps to increase nutrient cycling in those habitats and prevents an over-accumulation of decaying SAV on the seafloor (Thayer et al. 1984). In addition to maintaining habitats, sea turtles also aid in balancing the food web in their marine environments. Leatherbacks, for example, prey primarily upon jellyfish and help to prevent the proliferation of this group that can easily outcompete fish species in the same area (Lynam et al. 2006).

The Alabama red-bellied turtle is typically found in shallow vegetated backwaters of freshwater streams, rivers, bays, and bayous in or adjacent to Mobile Bay. They prefer habitats having soft bottoms and extensive beds of submergent aquatic macrophytes (aquatic plants that grow in or near water).

The gopher tortoise usually lives in relatively well-drained, sandy soils generally associated with longleaf pine and dry oak sandhills. They also live in scrub, dry hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, mixed hardwood-pine communities, and a variety of habitats that have been disturbed or altered by man, such as power line rights-of-way, and along roadsides.

Environmental Consequences

No Action

Under the no action alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to threatened and endangered reptiles would occur. Beneficial impacts from the placement of breakwaters which would protect these resources and enhance habitat would not occur.

Proposed Action

Potential adverse effects on sea turtles would be minimal and include noise and the presence of construction equipment. However, these impacts are expected to be short-term, localized, and minor. Due to the species' mobility and the implementation of NMFS's Sea Turtle and Small-tooth Sawfish Construction Conditions, the risk of injury from construction would be negligible. Land based-deployment is the preferred method for WAU placement and it is anticipated that all potential impacts to sea turtles would be due to land-based WAU placement equipment. However, it is extremely unlikely that noise from construction equipment would have a measurable impact sea turtles. Immediately following WAU placement, turbidity may increase, but impacts would be minimal and short-term. If it is determined that in-water work would be necessary, best management practices which would be implemented in accordance with the National Marine Fisheries Service's Sea Turtle and Small-tooth Sawfish Construction Conditions (NMFS 2006) to minimize adverse impacts to sea turtles are as follows:

- All vessels associated with the construction project would operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom.
- All project work would be in-water and no sea turtle nesting habitat exists in the project area. All construction personnel would be trained on what they are to do if the presence of a sea turtle is detected.
- All construction personnel would be notified of the potential presence of sea turtles in the water and would be reminded of the need to avoid sea turtles.
- If any sea turtles are found to be present in the immediate project area during activities, construction would be halted until species moves away from project area.
- Construction activities would occur during daylight hours to the maximum extent possible and noise would be kept to the minimum feasible.
- All construction personnel would be notified of the criminal and civil penalties associated with harassing, injuring, or killing sea turtles.

Sea turtle entrapments is a concern with certain types of WAUs and/or similarly shaped artificial reefs, especially large units placed on sandy sediments in high current areas. The waterbottoms at the project site consist of stiff clay to silty sandy sediments. As such the WAUs would most likely settle six to eight inches into the sediments. This settlement, which is taken into account during engineering and design, would prevent sea turtles from entering the WAUs from gaps between the waterbottoms and the

bottom of the WAU. Additionally, the WAUs themselves, including the holes in the proposed WAUs, are smaller than the offshore units where sea turtle entrapment has been observed. The size of the WAUs and the size of the holes in the WAUs to be used at the project site would prevent adult sea turtles from entering the units. Finally, the proposed project site is located in brackish, relatively turbid waters, where sea turtles rarely are known to forage. Based on these factors, sea turtle entrapment is the risk of sea turtle entrapment is very low.

Since the Alabama red-bellied turtle rarely occurs in saltwater, and considering most of the populations occur in the backwaters of upper Mobile Bay, no impacts are expected.

Since construction equipment would be operating and constructing breakwaters from either the existing ROW or in the open water, no potential adverse effects to the gopher tortoise, Eastern indigo snake, or black pine snake are expected.

11.2.5.2.4 Summary of Impacts to the Biological Environment

Impacts to the biological environment from implementation of the Shell Belt and Coden Belt Roads Living Shoreline Project would include:

- SAV: SAV are not present in the area and there would be no impacts.
- Benthos, invertebrates and fish: Potential short-term minor adverse effects to benthic organisms, invertebrates, and fish may occur during construction activities due to breakwater placement and noise. Following construction, there is expected to be increased habitat utilization of the breakwaters and near-shore environment by these species and a beneficial, long-term impact is anticipated.
- EFH: Potential short-term minor adverse effects to EFH components such as soft bottom substrates are expected. Construction activities and equipment noise associated with construction may reduce habitat utilization by EFH species in the area. Long-term benefits to EFH, especially for shrimp, and red drum, include foraging habitat, increased cover for juveniles and improved water quality.
- Marine mammals: Short-term minor adverse effects due to noise, prey availability, and turbidity associated with breakwater placement may temporarily disturb certain dolphin species in the vicinity of the project area. The short duration of construction activities and localized nature of the project would aid in preventing incidental take of dolphins.
- Terrestrial species: Short-term minor adverse impacts to terrestrial vegetation would occur due to use of construction equipment along the shoreline. Potential short-term minor adverse effects could occur to birds and reptiles from elevated noise levels during construction. No impacts to mammals would occur.
- Potential impacts to threatened and endangered species are presented below in Table 11-5.

Coordination and informal consultation under the Endangered Species Act (USFWS jurisdiction), Migratory Bird Treaty Act, and Bald and Golden Eagle Protection Act has been completed. Because of nearby suitable habitat and the ability to properly implement conservation measures, the Trustees have

determined the proposed project may affect, but will not likely adversely affect the Gulf sturgeon in freshwater, West Indian manatee, loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, leatherback sea turtle, and hawksbill sea turtle (on land). Accordingly, the Trustees have made a "Not Likely to Adversely Affect" determination under the ESA (USFWS jurisdiction) for those species. For all species in the area (see Table 11-5) the USFWS concurred that no threatened, endangered or candidate species or critical habitat or other protected species would be adversely affected as a result of implementing the proposed project. In June 2015, the Trustees requested concurrence from the USFWS regarding these determinations (DOI 2015). The U.S. Fish and Wildlife Service provided concurrence with this determination on July 9, 2015 (USFWS 2015). ESA consultation for NOAA species and habitats was initiated on May 27, 2015. EFH consultation was initiated with NOAA and concluded on June 5, 2015.

Table 11-5. Threatened and Endangered Species Potentially Affected by the Proposed Project

Common Name	Scientific Name	Federal Status	Trustees' Affect Determination
Gulf sturgeon	Acipenser oxyrinchus desotoi	Threatened	Not Likely to Adversely Affect
West Indian manatee	Trichechus manatus	Endangered	Not Likely to Adversely Affect
Loggerhead sea turtle	*Caretta caretta*	Threatened	Not Likely to Adversely Affect
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	Not Likely to Adversely Affect
Green sea turtle	*Chelonia mydas (P)*	Threatened	Not Likely to Adversely Affect
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	Not Likely to Adversely Affect
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	Not Likely to Adversely Affect
Gopher tortoise	*Gopherus polyphemus*	Threatened (Mobile County)/Candidate Species (Baldwin County)	No Effect
Alabama red-belly turtle	Pseudemys alabamensis	Endangered	No Effect
Black pine snake	*Pituophis melanoleucus lodingi*	Proposed Threatened	No Effect
Eastern indigo snake	*Drymarchon corais couperi*	Threatened	No Effect
Piping plover	*Charadrius melodus*	Threatened	Not Likley to Adversely Affect
Red knot	*Calidris canutus rufa*	Threatened	Not Likely to Adversely Affect
Wood stork	*Mycteria americana*	Threatened	No Effect

11.2.5.3 Human Uses

11.2.5.3.1 Cultural Resources

Affected Resources

The Shell Belt and Coden Belt Roads Living Shoreline Project is currently being reviewed under NHPA Section 106 to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. An initial review of the project has not identified the presence of a historic property within the project area. The Section 106 review process is ongoing and management of Section 106 compliance is being led by the Department of the Interior. A list of properties in the Alabama Register of Historic Places from Mobile County was consulted. There were no properties found at the location of the project area (AHC 2013a). A list of Alabama properties in the National Register of Historic Places, from Mobile County was referenced and there were no properties found at the location of the project area. The Leatherbury George House was a listed property on Shell Belt Road, Southeast of Sans Souci Beach, but was destroyed during Hurricane Katrina in 2005 (AHC 2013b).

Environmental Consequences

No Action

Under the no action alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to cultural resources would occur.

Proposed Action

No known cultural resources are located in or adjacent to the area that could be impacted by the Proposed Action. A complete review of this project under Section 106 is ongoing. That review would be completed prior to undertaking any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse effects on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

11.2.5.3.2 Infrastructure

Affected Resources

The project area is in the offshore water in Portersville Bay, Alabama. Shell Belt and Coden Belt Roads are directly adjacent to the shoreline along the project areas. The land is developed for human habitation and there are structures to water supply, and utilities near land to project area. There is an existing bulkhead seaward of the ROW along the Portersville Bay shoreline.

Environmental Consequences

No Action

Under the no action alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to infrastructure would occur.

Proposed Action

Sections 6.4.3 and 6.7.9.1 of the Final Phase III ERP/PEIS describe the impacts to infrastructure from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that projects involving ground- or substrate-disturbing construction activities, such as the placement of engineered shoreline protection structures, could lead to short and long-term minor to major adverse impacts to infrastructure. These impacts would result if there were inadvertent damage to unknown submerged offshore pipeline infrastructure or buried onshore utility infrastructure. Projects requiring land-based construction activities and associated movement of construction materials and equipment by road could lead to short and long-term minor to major adverse impacts to infrastructure. For this project, impacts to infrastructure were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

The logistics of the construction process are dependent upon the construction contractor. At this time, it is anticipated that the construction contractor would use existing land based facilities and loading areas to stage breakwater materials along with construction equipment. It is anticipated that all construction activities would take place from the existing ROW along the project area.

It is anticipated that that the breakwater materials and a long-arm track-hoe would be staged along the ROW. This track-hoe could then place the breakwater materials to its seawards side. Temporary road closures on Shell Belt and Coden Belt Roads would likely be set in place during construction. Placement of the breakwater units would be monitored to insure the breakwaters are constructed as specified. Temporary road closures would have short-term minor impacts to infrastructure due to their temporary nature and traffic mitigation measures put in place during construction. Should work occur in-water, no road closures would be necessary. No other impacts to infrastructure under either construction method are anticipated.

Potential mitigation measures for impacts to land and marine management are found in Appendix 6A of the Final Phase III ERP/PEIS. Any of these measures that would apply to the Shell Belt and Coden Belt Roads Living Shoreline Project may be used to minimize adverse impacts.

11.2.5.3.3 Land and Marine Management

Affected Resources

Land Use

The land in the general area is mainly private ownership. This primarily included single family homes, empty lots and undeveloped lands. There is one public park along the northern side of Coden Belt Road.

Coastal Zone Management

The project is located in a coastal area that may be regulated by the federal CZMA of 1972, which is implemented through the Alabama Coastal Area Management Program (ACAMP). The CZMA defines coastal zones wherein development must be managed to protect areas of natural resources unique to coastal regions. In addition, the CZMA requires federal actions to be consistent with a state's federally approved coastal management program where those activities would affect a coastal use or resource of the state.

The Federal Trustees' consistency determination for this project was submitted to the Alabama Department of Environmental Management (ADEM) on May 21, 2015. Via letter dated June 24, 2015, ADEM concurred with that determination of consistency with the enforceable policies of the Alabama Coastal Area Management Program for these proposed activities. The project will remain subject to additional consistency review as may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, coincident with applicable permitting processes.

Environmental Consequences

No Action

Under the no action alternative, the proposed living shoreline project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to land and marine management would occur. Beneficial impacts for land management from the protection of the breakwaters would not be realized.

Proposed Action

Sections 6.4.4 and 6.7.10.1 of the Final Phase III ERP/PEIS describe the impacts to land and marine management from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that project types related to restoration activities would have no impact to land and marine management, since projects would generally be consistent with the prevailing management plans and direction governing the use of the land and marine areas where the projects would take place. Some short-term minor to moderate adverse impacts could occur if these activities require temporary closure of areas that are managed for fishing or recreational use. In the long-term, because projects aimed at habitat restoration and conservation of living resources would align with and further the management goals of marine protected areas, these projects are expected to have beneficial impacts on marine management. For this project, impacts to land and marine management were analyzed

adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

This project is located in the State of Alabama's designated coastal zone. Under the CZMA, any federal action that would have reasonably foreseeable effects on a state's coastal uses or resources must be consistent with the enforceable policies of the state's federally approved coastal management program. The Federal Trustees' consistency determination for this project was submitted to the Alabama Department of Environmental Management (ADEM) on May 21, 2015. Via letter dated June 24, 2015, ADEM concurred with that determination of consistency with the enforceable policies of the Alabama Coastal Area Management Program for these proposed activities. The project remains subject to additional consistency review as may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, coincident with applicable permitting processes. This process is typically completed during the USACE CWA Section 404 permitting process and the ADCNR – State Lands Division permitting process.

The proposed action would be constructed consistent with the CZMA and the ACAMP and would not result in adverse short or long-term impacts to land and marine management within the project area There would be a potential long-term beneficial impact to land management of the Shell Belt and Coden Belt shoreline due to reducing shoreline erosion landward of the breakwater structure.

Potential mitigation measures for impacts to land and marine management are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would be implemented for this action would include construction workers and volunteers employed in the projects associated with restoration techniques would be adequately trained to ensure that impacts are minimized.

11.2.5.3.4 Aesthetics and Visual Resources

Affected Resources

The shoreline landward of the proposed action area is developed, public and private land. There is a road along the shoreline near the proposed breakwater areas. Portersville Bay is used for water-based recreation, fishing, agriculture, propagation of fish and wildlife, and shell-fishing (USEPA 2012). Visual receptors of the shoreline include recreational and commercial boaters. The current view from the water to the shoreline is unobstructed.

Aesthetics and Visual Resources Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to aesthetic and visual resources would occur because the existing visual landscape would remain unchanged.

Proposed Action

Sections 6.4.8 and 6.7.10.1 of the Final Phase III ERP/PEIS describe the impacts to aesthetics and visual resources from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that project types involving the use of construction equipment, including equipment used for the movement and placement of materials (i.e. barges) and barriers enacted to protect public safety would result in some minor to moderate short-term adverse impacts on aesthetics and visual quality. During the construction period, visible impedances would detract from the natural landscape and create visual contrast for observers visiting the project areas. The severity of impacts would depend to a large degree on the location of the proposed projects, the degree to which these activities would be visible, the duration of the construction activities and how commonplace these activities and equipment are in certain areas. Impacts would likely be greatest in areas frequented by large groups of visitors and in areas where more natural viewsheds exist (i.e. barrier islands). For projects resulting in the long-term placement of structures and signage, long-term minor adverse impacts to aesthetics would occur, though these types of objects are often commonplace and would become less intrusive over time. For this project, impacts to aesthetics and visual resources were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

As a result of this project, new navigational signs would be installed along the breakwater segments to warn marine traffic of the potential underwater obstruction. The signs would not dominate the view or detract from the current user activities or experiences; however, the intent of the signage is to attract attention in order to inform the public for their safety.

The proposed action would result in minor, short term visual impacts while construction equipment is used at the project site. The placement of navigational signs would result in a direct, long term, minor adverse impact on the aesthetics and visual resources of the area and these signs would become less intrusive overtime.

Potential mitigation measures for impacts to aesthetic and visual resources are found in Appendix 6A of the Final Phase III ERP/PEIS. BMPs that would be implemented as part of this action include:

- Use of existing access ways whenever possible. Temporary access roads would not be built in locations that would suggest a likelihood of excessive erosion (e.g., large slopes, erosive soils, proximity to water body). All temporary access roads would be restored when the action is completed, the soil would be stabilized, and the site would be re-vegetated.
- Maintenance of generators, cranes, and any other stationary equipment operated within 150 feet of any natural or wetland area as necessary to prevent leaks and spills from entering the water.
- Employment of standard BMPs for construction to reduce erosion.
- Development and implementation of spill prevention and control plans to minimize the risk of release of petroleum and oil products into receiving waters.

11.2.5.3.5 Tourism and Recreation

Affected Resources

The affected resources include the waters, water bottoms and estuaries along the Shell Belt and Coden Belt shoreline, which is primarily in public ownership. These resources are used by the public primarily for recreational boating, fishing, and bird watching. The shoreline is developed with roadways and private residences.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to tourism and recreation would occur.

Proposed Action

Sections 6.4.5 and 6.7.11.1 of the Final Phase III ERP/PEIS describe the impacts to tourism and recreation from early restoration projects to protect shorelines and reduce erosion. The Final Phase III ERP/PEIS found that project types involving ground or substrate disturbing construction activities as well as restoration activities could result in some short-term minor to moderate adverse impacts to wildlife viewing, short-term minor to moderate adverse impacts to hunting, beach and waterfront visitors, and tourism and short-term minor to moderate adverse impacts to fishing. Long-term benefits would occur from the improvement of wildlife and aquatic species habitat and associated increases in wildlife and aquatic species populations, diversity and viewing opportunities. For this project, impacts to tourism and recreation were analyzed adequately within the PEIS as the site-specific impacts discussed below fall within the range of impacts for this project type in the Final Phase III ERP/PEIS.

During construction of the breakwaters, there would be short-term, minor adverse impacts to public access and use of open water areas for boat traffic; access would be restricted due to safety concerns. Following construction, there would be minor adverse impacts to public access and recreation since the breakwaters would prevent free-flowing transit between the reef and the shoreline. To avoid any significant navigational disturbances, permanent navigation markers or signage would be installed to assure safe navigation for marine traffic.

The proposed action would have a short term, adverse impact to recreational use of the area during construction since the area would be avoided by recreational boaters. The action would result in a beneficial impact due to increased use of created reef for fishing due to the expected use of the reef by recreationally important fish such as speckled trout and red drum. The project would result in a long-term, minor adverse impact due to the placement of new navigational signs where none currently exist. The project would not result in adverse long term indirect impacts to recreational use.

Potential mitigation measures for impacts to tourism and recreational use are found in Appendix 6A of the Final Phase III ERP/PEIS. Any of these measures that would apply to the Shell Belt and Coden Belt Roads Living Shoreline project may be used to minimize adverse impacts.

11.2.5.3.6 Public Safety and Shoreline Protection

Affected Resources

The project area is on the waterbottoms of Portersville Bay, Mobile County, Alabama. Shell Belt and Coden Belt Roads are directly adjacent to the shoreline along the project areas. There is an existing bulkhead seaward of the road ROW along the shoreline. The shoreline landward of the road ROW is developed public and private land. Breakwater construction has the potential to impact the shoreline and human safety. A number of boat launches and roads exist near the potential construction site.

Environmental Consequences

No Action

Under the No Action Alternative, the proposed living shorelines project would not be constructed at Shell Belt and Coden Belt Roads and no impacts to public health, safety, and shoreline protection would occur.

Proposed Action

Any disturbances from this project would occur within the established road network, with limited potential for the public to encounter hazardous material. No chemical waste would be created during construction. Any hazardous material from machinery would be contained through appropriate barriers to prevent potential spills and leaks. Because health and safety measures would be followed during construction, adverse impacts are not expected.

11.2.5.3.7 Summary of Impacts to Human Uses

Impacts to human uses from implementation of the Shell Belt and Coden Belt Roads Living Shoreline Project would include:

- Cultural Resources: A complete review of this project under Section 106 is ongoing. That review would be completed prior to undertaking any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse effects on historic properties located within the project area.
- Land and Marine Management: The proposed action would be constructed consistent with the CZMA and the ACAMP and would not result in adverse short or long-term impacts to land and marine management within the project area. There would be a potential long-term beneficial impact to adjacent public lands by reducing shoreline erosion landward of the reef structure.
- Aesthetics and Visual Resources: The proposed action would result in minor, short term visual impacts while construction equipment is used at the project site. The placement of navigational

signs would result in a direct, long term, minor adverse impact on the aesthetics and visual resources of the area and these signs would become less intrusive over time.

- Tourism and Recreation: There would be short-term, minor adverse impacts to public access and use of open water areas for boat traffic during construction. Following construction, there would be minor adverse impacts to public access and recreation since the reefs could prevent free-flowing transit between the reef and the shoreline. Increased use of the created reef for fishing would be long-term and beneficial.
- Public Safety and Shoreline Protection: All health and safety measures would be followed during construction and no adverse impacts are expected.

11.2.6 Cumulative Impacts

As discussed in Chapter 4, the CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined as "the impact on the 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" (40 C.F.R. § 1508.7).

The Shell Belt and Coden Belt Roads Living Shoreline Project cumulative impacts analysis tiers from the Final Phase III ERP/PEIS analysis of Alternative 4 (Contribute to Restoring Habitats, Living Coastal and Marine Resources, and Recreational Opportunities), which evaluated the type of restoration activity proposed for the Shell Belt and Coden Belt Roads Living Shoreline Project. The Final Phase III ERP/PEIS analysis of cumulative impacts relevant to the proposed Shell Belt and Coden Belt Roads Living Shoreline Project is incorporated by reference into the following cumulative impacts analysis. The following analysis focuses on the potential additive effects of the proposed Shell Belt and Coden Belt Roads Living Shoreline Project to the effects of past actions evaluated in the Final Phase III ERP/PEIS cumulative impacts analysis and the effects of some past, present, and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS.

11.2.6.1 Site Specific Review and Analysis of Cumulative Impacts to Relevant Resources

This section describes past, present, and reasonably foreseeable future actions that were not discussed in the Final Phase III ERP/PEIS, but which are relevant to identifying any cumulative impacts the proposed Shell Belt and Coden Belt Roads Living Shoreline Project may have on a local scale. Context and intensity, defined in Section 11.2.5, are used to determine whether a potential significant cumulative impact from the Shell Belt and Coden Belt Roads Living Shoreline Project exists.

For the Shell Belt and Coden Belt Roads Living Shoreline Project, specifically, the relevant affected resources analyzed in this EA are:

- Geology and Substrates
- Hydrology and Water Quality
- Air Quality and Greenhouse Gas Emissions
- Living and Coastal Marine Resources

- Infrastructure
- Land and Marine Management
- Tourism and Recreation Use
- Aesthetics and Visual Resources

Those resources described in Section 11.2.5 as considered but not carried forward for further analysis would not have impacts and therefore, would not have cumulative impacts. Local and site-specific past, present and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS were investigated through conversations with ALDCNR staff and searching websites relevant to the Shell Belt and Coden Belt Roads Living Shoreline Project. The local action area is defined as the site of the living shoreline project and immediate surroundings of those areas. Actions that would be relevant to the Shell Belt and Coden Belt Roads Living Shoreline Project cumulative impacts analysis are defined here as those with similar scope, timing, impacts or location. Websites searched include:

- http://www.nfwf.org/whoweare/mediacenter/pr/Pages/gulf-main-pr-14-1117.aspx
- http://eli-ocean.org/gulf/restoration-projects-database/

This search provided the following additional information on actions relevant to the Shell Belt and Coden Belt Roads Living Shoreline Project cumulative impacts analysis.

- ERP I - Marsh Island Restoration: 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 will restore approximately 50 acres of salt marsh through the placement of a permeable segmented breakwater, the placement of sediments and the planting of native marsh vegetation. Additionally, the breakwater will provide protection for the existing 24 acres of Marsh Island, which has been experiencing shoreline loss at the rate of 5-10 feet per year. The Marsh Island Restoration Project is approximately 3 miles from the Shell Belt and Coden Belt Roads Living Shorelines Project site.

The Shell Belt and Coden Belt Roads Living Shoreline Project and the Marsh Island Restoration Project would both involve habitat restoration and construction of both projects could occur at the same time and contribute to cumulative impacts for the resources discussed below.

11.2.6.1.1 Geology and Substrates

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.1 Geology and Substrates. The Final Phase III ERP/PEIS found that when Alternative 4 was analyzed in combination with other past, present, and reasonably foreseeable future actions, short and long-term cumulative adverse impacts to geology and substrates would likely occur. However Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts had the potential to result in some long-term beneficial cumulative impacts to geology and substrates in localized areas. Alternative 4 was not expected to contribute substantially to cumulative adverse impacts. The Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

The analysis in Section 11.2.5.1.1 determined that the Shell Belt and Coden Belt Roads Living Shoreline Project would have a short term, minor, adverse impacts to geology and substrates. Activities that would occur in support of the Marsh Island Restoration Project would be expected to have a similar level of impact during construction. Both projects would have long-term benefits from enhanced shoreline protection and habitat creation.

Based on these findings, the Shell Belt and Coden Belt Roads Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to geology and substrates.

11.2.6.1.2 Hydrology and Water Quality

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.2 Hydrology and Water Quality. The Final Phase III ERP/PEIS found that When analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to water quality and hydrology. Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to hydrology and water quality in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities. The Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

The analysis in Section 11.2.5.1.2 determined the Shell Belt and Coden Belt Roads Living Shoreline Project would have a short term, minor, adverse impacts to water quality and minimal impacts to hydrology. Activities that would occur in support of the Marsh Island Restoration Project would be expected to have a similar level of impact during construction. Both projects would have long-term benefits from enhanced shoreline protection and habitat creation.

Based on these findings, the Shell Belt and Coden Belt Roads Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to hydrology and water quality.

11.2.6.1.3 Air Quality and Greenhouse Gases

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.3, Air Quality and Greenhouse Gases. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to air quality or greenhouse gas emissions. To the extent that they increase CO2 absorption, Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in some long-term beneficial cumulative impacts to greenhouse gas emissions because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities. The Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts.

As described in Section 11.2.5.1.3, the Shell Belt and Coden Belt Roads Living Shoreline Project would have a temporary, minor adverse impact on air quality and GHGs. When taken into consideration with the Marsh Islands Restoration Project which would also have temporary and localized impacts, the expected cumulative impacts are consistent with those analyzed in the Final Phase III ERP/PEIS.

Based on these findings, the Shell Belt and Coden Belt Roads Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to air quality and GHG levels.

11.2.6.1.4 Living Coastal and Marine Resources

This analysis tiers from the Phase III ERP/PEIS, Section 6.8.4.2.2, Living Coastal and Marine Resources. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to living coastal and marine resources. Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to living coastal and marine resources in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities. The Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 11.2.5.2.1, the Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to have short-term and localized impacts to living coastal and marine resources with long-term beneficial impacts from habitat creation and shoreline protection. During construction, similar short-term, localized minor adverse impacts would be expected as a result of the Marsh Islands project, with similar long-term benefits. While construction could occur at the same time, impacts of each project would be localized and are not expected to contribute to adverse cumulative impacts. Once completed, the area would experience long-term benefits of both of these projects.

Based on these findings, the Shell Belt and Coden Belt Roads Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to living coastal and marine resources.

11.2.6.1.5 Infrastructure

This analysis tiers from the Phase III ERP/PEIS, Section 6.8.4.3.3, Infrastructure. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to infrastructure. Alternative 4 carried out in conjunction with other infrastructure improvement projects may result in long-term beneficial cumulative impacts to infrastructure in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other activities. The Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 11.2.5.3.2, the Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to have short-term and localized impacts to infrastructure due to short-term roadway

closures. Any potential impacts to infrastructure from the Marsh Islands project during the same timeframe would be removed geographically from the road closures, and any impacts would not have interaction with each other.

Based on these findings, the Shell Belt and Coden Belt Roads Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to infrastructure.

11.2.6.1.6 Land and Marine Management

This analysis tiers from the Phase III ERP/PEIS, Section 6.8.4.3.4, Land and Marine Management. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to land and marine management. Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to land and marine management in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities from the alignment of management goals and assistance provided to management and staff to best manage properties from restoration, conservation and recovery efforts. The Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 11.2.5.3.3, the Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to have a minor, short-term adverse impact on land and marine management, lasting during construction activities, with all applicable laws and regulations regarding coastal zone management being adhered to and minimizing potential impacts. There would be a potential long-term beneficial impact to adjacent public lands by reducing shoreline erosion landward of the reef structure. The Marsh Islands project would be expected to result in similar short-term minor adverse impacts, but due to their localized nature, would not contribute to cumulative impacts when combined with the Shell Belt and Coden Belt Roads Living Shoreline Project. Long-term benefits from both projects would occur.

Based on these findings, the Shell Belt and Coden Belt Roads Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to land and marine management.

11.2.6.1.7 Aesthetics and Visual Resources

This analysis tiers from the Phase III ERP/PEIS, Section 6.8.4.3.8, Aesthetics and Visual Resources. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to aesthetics and visual resources. Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to aesthetics and visual resources in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities. The Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 11.2.5.3.4, the Shell Belt and Coden Belt Roads Living Shoreline Project could result in a minor, long-term impact on aesthetic and visual resources, from the placement of navigational signage. When taken into consideration with Marsh Island project, the minor, long-term adverse visual impact is of both projects would be minor and localized.

Based on these findings, the Shell Belt and Coden Belt Roads Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to aesthetics and visual resources.

11.2.6.1.8 Tourism and Recreational Use

This analysis tiers from the Phase III ERP/PEIS, Section 6.8.4.3.5, Tourism and Recreational Use. The Final Phase III ERP/PEIS found that when analyzed in combination with other past, present, and reasonably foreseeable future actions, Alternative 4 would not contribute substantially to short-term or long-term cumulative adverse impacts to tourism and recreational use. Alternative 4 carried out in conjunction with other environmental stewardship and restoration efforts may result in long-term beneficial cumulative impacts to tourism and recreational use in the Gulf Coast region because of the potential for synergistic effects of Alternative 4 project types with these other environmental stewardship and restoration activities. The Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impacts analysis.

As described in Section 11.2.5.3.5, the Shell Belt and Coden Belt Roads Living Shoreline Project is anticipated to have a minor short term, adverse impact to recreational use of the area during construction since the area would be avoided by recreational boaters. The action would result in a beneficial impact due to increased use of created reef for fishing due to the expected use of the reef by recreationally important fish such as speckled trout and red drum. Any closures to recreational use from the Marsh Islands project would be localized, and would not interact with any potential closures from the Shell Belt and Coden Belt Roads Living Shoreline project. Long-term beneficial cumulative impacts are anticipated to recreational use in the area after both projects are completed.

Based on these findings, the Shell Belt and Coden Belt Roads Living Shoreline Project is not expected to contribute significantly to adverse cumulative impacts to tourism and recreational use.

11.2.6.2 Potential Cumulative Impacts When Evaluated with Other Phase III and Proposed Phase IV Projects

Due to the minor, local and temporary impacts from the project, the Shell Belt and Coden Belt Roads Living Shoreline Project is not anticipated to contribute to potential adverse cumulative impacts in combination with other Phase IV projects. In terms of location, the closest Phase IV proposed project to the Shell Belt and Coden Belt Roads Living Shoreline Project is the Point aux Pins Living Shoreline Project. That project consists of creating a living shoreline to reduce shoreline erosion. Cumulatively, these two projects would produce minor, short-term adverse environmental impacts from disturbance to natural and human resources (water quality, geology and substrates, coastal and marine resources, noise, tourism and recreation, and visual and aesthetics). Both of these efforts would contribute to beneficial impacts through the reduction in shoreline erosion, protection of water resources from breakwaters,

and habitat enhancement. Phase III projects in the vicinity of the Shell Belt and Coden Belt Roads Living Shoreline Project include the Swift Tract Living Shoreline Project and the Alabama Oyster Cultch Project. The Swift Track Living Shorelines project will employ living shoreline techniques that utilize natural and/or artificial breakwater material to stabilize shorelines along an area in the eastern portion of Bon Secour Bay, Alabama. Cumulatively, these two projects would not produce adverse environmental impacts in the short-term as construction activities would not be expected to occur at the same time. Further, the Swift Tract site is approximately 25 miles from the Shell Belt and Coden Belt Roads Living Shoreline Project site, and is geographically disconnected from each other for contribution to adverse impacts. Both projects would contribute to beneficial impacts through the reduction in shoreline erosion, protection of water resources from breakwaters, and habitat enhancement in the general area. The Alabama Oyster Cultch Project would enhance and improve the oyster populations in the estuarine waters of Alabama by placing approximately 30,000 – 40,000 cubic yards of suitable oyster shell cultch over approximately 319 acres of subtidal habitat in Mobile County, Alabama. The construction of this project would not occur at the same time as the Shell Belt and Coden Belt Roads Living Shoreline Project and is not expected to have short-term cumulative impacts. Long-term, both projects would enhance habitat in the area, resulting in beneficial impacts.

The Shell Belt and Coden Belt Roads Living Shoreline Project would not contribute adverse cumulative impacts when added to past, present or reasonably foreseeable future actions.

11.2.7 Summary and Next Steps

The proposed Shell Belt and Coden Belt Roads Living Shoreline project would increase benthic productivity and protect planted native marsh vegetation. The project is consistent with Alternative 4 (Preferred Alternative) of the Final Phase III ERP/EIS. Draft NEPA analysis of the environmental consequences suggests that while minor adverse impacts to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would provide long-term benefits by creating habitat and protecting shorelines. The Trustees have started coordination and reviews under the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, the National Historic Preservation Act, the Marine Mammal Protection Act, the Bald and Golden Eagle Protection Act, and other federal statutes. The Trustees have initiated consultation on the ESA (NOAA jurisdiction) and MSFCMA. . The Trustees are awaiting NMFS SERO's response on ESA, while the consultation for MSFCMA is complete (NOAA EFH Assessment, June 5, 2015). For MSFCMA compliance, NOAA concurs that adverse impacts of project implementation are expected to be minor, and the proposed project should have an overall net beneficial cumulative impact on EFH resources. The Trustees have completed coordination and reviews under the Marine Mammal Protection Act and determined that this project does not require authorization under the MMPA. Pursuant to the Coastal Zone Management Act of 1972, federal actions must be consistent with the federally approved coastal management programs for states where the activities would affect a coastal use or resource of the state. The Federal Trustees' consistency determination for this project was submitted to the Alabama Department of Environmental Management (ADEM) on May 21, 2015. Via letter dated June 24, 2015, ADEM concurred with that determination of consistency with the enforceable policies of the Alabama Coastal Area Management Program for these proposed activities. The project remains subject to

additional consistency review as may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, coincident with applicable permitting processes.

Coordination and informal consultation under the ESA, MBTA and BGEPA has been completed. The USFWS concurred that no threatened, endangered, or candidate species or critical habitat or other protected species would be adversely affected as a result of implementing this proposed project.

The Trustees have initiated coordination and review under Section 106 of the NHPA. A complete review of this project will be completed prior to project implementation. NHPA Section 106 and Tribal consultations may further identify potential cultural resources in the project areas and any mitigation measures necessary to protect those resources.

The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. Public comments and Trustee responses are found in Chapter 15.

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Chapter 12: Seagrass Recovery Project at Gulf Islands National Seashore, Florida District

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12.1 Seagrass Recovery Project at Gulf Islands National Seashore, Florida District: Project Description

12.1.1 Project Summary

The Seagrass Recovery Project at Gulf Islands National Seashore's Florida District (hereafter, GUIS) will address damage to shallow seagrass beds on DOI-managed lands in the five Gulf States by restoring injury to turtle grass (*Thalassia testudinum*) in seagrass beds located on the south side of the Naval Live Oaks Preserve in Santa Rosa Sound, in Santa Rosa County.

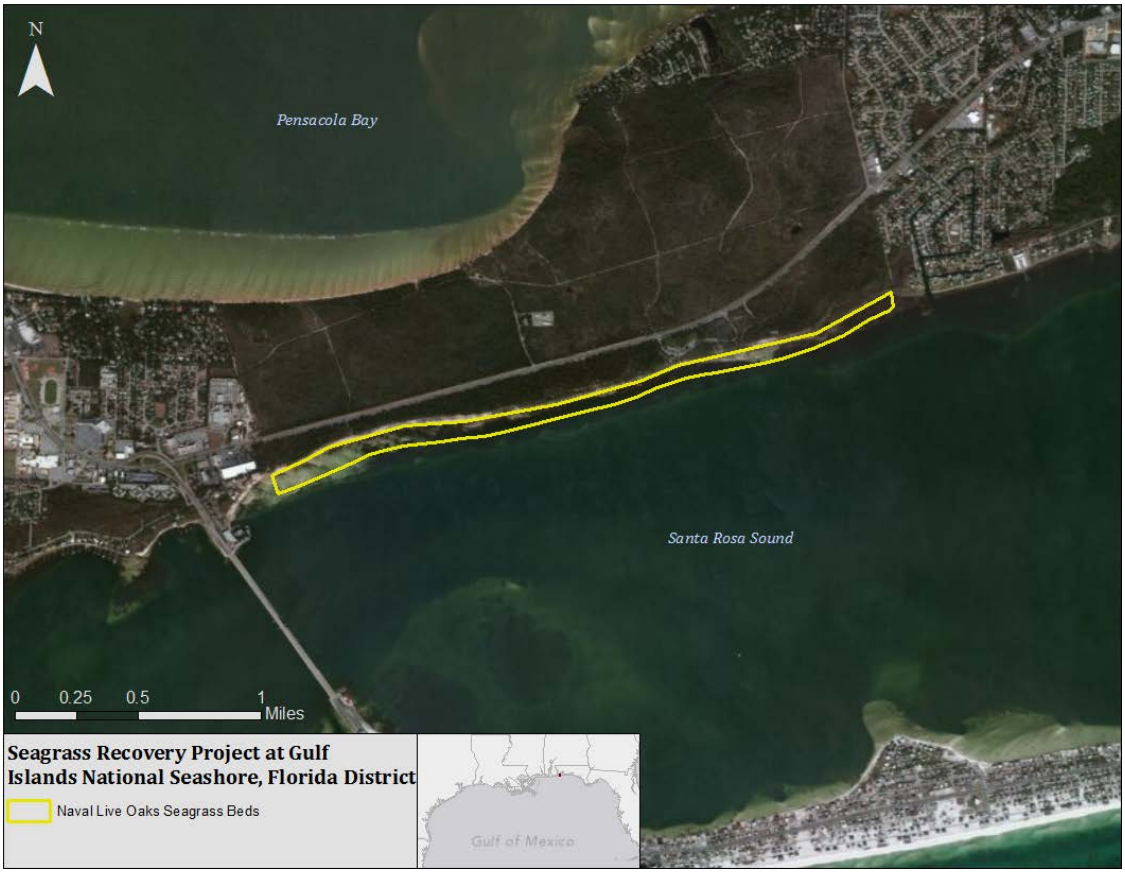
12.1.2 Background and Project Description

The Trustees will implement this project to address damage to shallow seagrass beds on DOI-managed lands in the five Gulf States by restoring injured turtle grass habitats through seagrass transplant and sediment conditioning in GUIS. Turtle grass is a commonly-found species of submerged aquatic vegetation (SAV) along the Florida panhandle that is particularly slow to rejuvenate naturally when injured. Turtle grass beds can take many years to rejuvenate, or in severely scarred areas may never completely recover. At GUIS, seagrass beds are injured through propeller scars, blow holes, and via repeated human foot traffic which damages root systems. Propeller scars are made when boat propellers cut up roots, stems, and leaves of seagrasses, producing long, narrow furrows devoid of vegetation.

The project will be located in Santa Rosa Sound in Santa Rosa County, on the south side of the Naval Live Oaks unit of GUIS (see Figure 12-1 for project location). This area contains important turtle grass habitat that, if not restored, will continue to degrade and impact more of the healthy habitat surrounding the injured areas.

The objective of the Seagrass Recovery Project at GUIS is to promote full recovery of approximately 0.02 acres of seagrass injured from propeller scars, blow holes, and/or trampling from foot traffic when fishers and other recreationalists wade into the shallow seagrass beds. An initial assessment survey will be conducted in the Naval Live Oaks unit of GUIS to identify priority restoration sites. The restoration work includes: 1) harvesting seagrass (specifically shoal grass [*Halodule wrightii],* a more hardy, faster growing pioneer species of seagrass, which helps establish proper site conditions for the eventual colonization of healthy turtle grass) from nearby donor sites and transplant them into the injured areas, 2) installing bird stakes to condition the sediments to promote survival and growth of transplants and seagrass from adjacent, uninjured areas into the injured areas, and 3) monitoring sites to measure and report on the success of the restoration work. There will also be an education component which will include signage to alert visitors to the restoration project and the danger their actions pose to seagrass beds.

Figure 12-1. Location of Seagrass Recovery Project at Gulf Islands National Seashore



12.1.3 Evaluation Criteria

This project satisfies the evaluation criteria for OPA and the Framework Agreement. As a result of the *Deepwater Horizon* oil spill and associated response activities, submerged aquatic vegetation on DOI-managed lands in the 5 Gulf States, including the Florida Panhandle, suffered adverse physical impacts. The project seeks to restore submerged aquatic vegetation like that injured by the Spill on DOI-managed lands in the five Gulf States through the restoration of turtle grass habitats in GUIS. The ecological benefits that will be gained by this restoration project are anticipated to help compensate the public for Spill-related injuries and losses to submerged aquatic vegetation on DOI-managed lands in the five Gulf States. Thus, nexus to resources injured by the Spill is clear (see 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement).

This project is technically feasible and utilizes proven techniques with established methods and documented results. GUIS and agencies of the state of Florida have successfully completed projects of similar scope throughout Florida over many years. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Furthermore, the

cost estimates are based on similar past projects; therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1) and Section 6e of the Framework Agreement.

A thorough environmental assessment, including review under applicable environmental laws and regulations, indicates that adverse impacts from the project will largely be minor, localized, and of short duration. In addition, best management practices and measures to avoid or minimize adverse impacts will be implemented. As a result, collateral injury will be avoided or minimized during project implementation. See 15 C.F.R. § 990.54(a)(4). This project is consistent with GUIS's management objectives. Therefore, this project is consistent with the long-term restoration needs of the National Park Service (See Section 6d of the Framework Agreement).

12.1.4 Performance Criteria and Monitoring

As part of the project cost, monitoring will be conducted to evaluate the success of the restoration project. The monitoring plan has been designed around the project objective, which is to restore seagrass.

The complete monitoring plan for this project is located in Appendix B.

12.1.5 Maintenance

This project has no long term maintenance requirements.

12.1.6 Offsets

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Habitat Equivalency Analysis to estimate appropriate Offsets for the Seagrass Recovery Project. Habitat Offsets (expressed in Discounted Service Acre Years [DSAYs]) were estimated for seagrass/submerged aquatic vegetation habitat. Habitat enhanced by this restoration will be based on the expected spatial extent, duration and degree of improvements attributable to the project. In estimating DSAYs, the Trustees considered a number of factors, including but not limited to benefits of restoring seagrass habitat, the time period that it will take for restored habitat to provide different levels of ecological benefits, and estimated project life. The Trustees and BP agreed that if this restoration is selected for implementation, BP will receive Offsets of 1.5 DSAYs of submerged aquatic vegetation habitat. This will be applicable to injuries to submerged aquatic vegetation habitat on lands managed by DOI in the five Gulf States, as determined by the Trustees' total assessment of injury for the Spill.

In the event that the injury determination for submerged aquatic vegetation habitat is quantified in the Natural Resource Damage Assessment using a metric other than DSAYs, the Trustees agree to translate the agreed upon NRD Offsets into a currency consistent with the metric used to characterize the injury to submerged aquatic vegetation habitat. Any necessary translation of the Offsets would rely on the data and methods developed for the assessment and authorized in 15 C.F.R. §§ 990, *et seq.*

12.1.7 Estimated Cost

The total estimated cost to implement this project is $136,700. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, implementation, and monitoring.

12.2 Seagrass Recovery Project at Gulf Islands National Seashore: Environmental Assessment

The proposed habitat restoration project involves the restoration of seagrass beds on DOI-managed lands through the transplanting of healthy seagrasses in damaged seagrass bed areas in the Naval Live Oaks Unit of GUIS. Seagrass beds are important wildlife habitat and food sources which also help reduce wave currents, stabilize sediments, and reduce coastal erosion. The most common species at GUIS, turtle grass, is particularly slow to recover from physical damage, and can take many years to rejuvenate from propeller damage naturally, and in severely scarred areas may never completely recover.

12.2.1 Introduction and Background, Purpose and Need

12.2.1.1 Introduction

CEQ encourages federal agencies to "tier" their NEPA analyses from other applicable NEPA documents to create efficiency and reduce redundancy, and has issued new guidance on the use of programmatic NEPA documents for tiering (79 *FR* 76986, December 23, 2014).

Tiering has the advantage of not repeating information that has already been considered at the programmatic level so as to focus and expedite the preparation of the tiered NEPA review(s). When a programmatic Environmental Assessment or Environmental Impact Statement (PEA or PEIS) has been prepared and an action is anticipated in, consistent with, and sufficiently explored within the programmatic NEPA review, the agency need only summarize the issues discussed in the broader statement, incorporate discussion from the broader statement by reference, and concentrate on the issues specific to the subsequent tiered proposal (CEQ 2014).

A federal agency may prepare a PEIS to evaluate broad actions (40 C.F.R. §1502.4(b); see Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18026 (1981)). When a federal agency prepares a PEIS, the agency may "tier" subsequent narrower environmental analyses on site-specific plans or projects from the PEIS (40 C.F.R. § 1502.4(b); 40 C.F.R. §1508.28). Federal agencies are encouraged to tier subsequent narrower analyses from a PEIS to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review (40 C.F.R. § 1502.20). The 2014 Final Programmatic and Phase III Early Restoration Plan and Programmatic Environmental Impact Statement (Final Phase III ERP/PEIS) was prepared for use in tiering subsequent early restoration plans and projects, such as Phase IV.

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the programmatic portions of the Final Phase III ERP/PEIS. This EA qualifies for tiering from the Final Phase III ERP/PEIS in accordance with Department of the Interior regulations (43 CFR 46.140, Using tiered documents) under "b" and "c". (Section 1.3, Relationship of Phase IV ERP/EA to the Final Phase III ERP/PEIS).

This project is consistent with the Final Phase III ERP/PEIS Preferred Alternative as described in the 2014 Record of Decision (79 *FR* 64831-64832 (October 31, 2014) and the Trustees find that the conditions

and environmental effects described in the broader NEPA document (with updates as described in Chapter 2) are valid. Specifically, this project tiers from the analyses found in the Development and Evaluation of Alternatives section (5.3.3.4) and the Environmental Consequences section (6.3.4, Project Type 4: Restore and Protect Submerged Aquatic Vegetation) of the Final Phase III ERP/PEIS. This EA incorporates by reference the analysis found in the PEIS in those sections. This EA also incorporates by reference all Early Restoration introductory, process, background, and Affected Environment information and discussion provided in the PEIS (Chapters 1 through 6).

12.2.1.2 Background

GUIS was established by the U.S. Congress on January 8, 1971 for the purpose of preserving areas possessing outstanding natural, historic, and recreational values for public use and enjoyment. Part of the national park system, the National Seashore encompasses barrier islands and coastal mainland in Mississippi and Florida and consists of 12 separate units stretching along 160 miles from Cat Island in Mississippi to the eastern end of Santa Rosa Island in Florida.

The Naval Live Oaks unit of the Florida District, where the Seagrass Recovery Project would occur, lies on the peninsula north of Santa Rosa Island. That peninsula separates Santa Rosa Sound from the Pensacola, Escambia, and East Bays of Escambia and Santa Rosa Counties. The Naval Live Oaks area was originally purchased by the U.S. government for use in experimenting with the cultivation of live oaks. When GUIS was established, the Naval Live Oaks area came under the management of the National Seashore. The area is largely a closed canopy live oak forest with little development. However, the area does include 7.5 miles of trails, a covered picnic pavilion, a Visitor Center, and park headquarters. Visitors access the narrow beach facing Santa Rosa Sound from the parking lot at the Visitor Center. The area of Santa Rosa Sound adjacent to the Naval Live Oaks area is a low-wave energy, estuarine environment with abundant seagrass. Visitors often wade in the sound and their foot traffic, as well as traffic from boats, impacts the growth of the area's seagrass beds. The seagrass communities of the Naval Live Oaks area are dominated by turtle grass, which is the target restoration species for the project. Seagrass communities are essential breeding, rearing, and feeding grounds for many important recreational and commercial fisheries as well as wildlife, including the endangered West Indian manatee (*Trichechus manatus latirostris*) and various species of sea turtles.

The proposed project would address damage to shallow seagrass beds on DOI-managed lands in the five Gulf States by restoring turtle grass habitats in GUIS that have been injured by propeller scars, blow holes, or foot traffic. Scars are made when boat propellers cut up roots, stems, and leaves of seagrasses, producing long, narrow furrows devoid of vegetation. Turtle grass is a commonly found species of seagrass along the Florida panhandle that is particularly slow to rejuvenate naturally. Turtle grass with propeller damage can take many years to rejuvenate naturally when injured, and in severely scarred areas may never completely recover. The proposed project area contains important turtle grass habitat that, if not restored, would continue to erode and potentially impact surrounding healthy SAV habitat. Restoring damage to SAV habitat would enhance vital coastal ecosystems and the commercial and recreational industries dependent upon them.

12.2.1.3 Purpose and Need

The purpose and need for this action falls within the scope of the purpose and need for early restoration as described in the programmatic portions of the Final Phase III ERP/PEIS because it would accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. The purpose of this project is to address damage to shallow seagrass beds on DOI-managed lands in the five Gulf States by restoring turtle grass habitats in GUIS. The goal of this project is to compensate the public for seagrass habitat on DOI-managed lands in the five Gulf States that was injured as a result of the *Deepwater Horizon* oil spill and associated response activities. The restoration project would restore approximately 0.02 acres of injured seagrass habitat in the Naval Live Oaks unit of GUIS.

12.2.2 Scope of Environmental Assessment

This project is proposed as part of Phase IV of the Early Restoration plan. This EA tiers from the Final Phase III ERP/PEIS. The broader environmental analyses of actions to restore habitats, living coastal and marine resources, including seagrass restoration, are discussed in the Final Phase III ERP/PEIS from which this EA is tiered. The information and analyses in this document supplements the programmatic analyses with site-specific information. This EA provides NEPA analysis for potential impacts for site specific issues and concerns anticipated from implementation of the proposed action and the no action alternative.

12.2.2.1 Project Alternatives

Over the five years since the Spill occurred, each of the five Gulf States, DOI, and NOAA have used various means to solicit restoration ideas and proposed projects from the public. Hundreds of restoration proposals have been submitted, summarized, and made available both to the Trustees and to the public as a whole through various Trustee websites (see Section 2.1 of the Final Phase III ERP/PEIS). These project proposals have informed and helped shape the Trustees' approach to early restoration projects.

The Early Restoration project selection process, which is consistent with the Framework Agreement, constrains the range of project alternatives that can be considered formally in Early Restoration. In particular, under the Framework Agreement, the Trustees negotiate with BP concerning the amount of funding that BP would provide for a specific proposed project and the NRD Offsets that BP would receive, to reduce its liability for NRD, in return for funding that project. Given the complexity of such negotiations, it would be impractical to negotiate funding and Offsets for multiple alternatives to each proposed project. Therefore, this Phase IV DERP/EA proposes the Seagrass Recovery Project at GUIS essentially in the form negotiated with BP. The Trustees did not negotiate funding and Offsets with BP for alternatives to this proposed project.

Both OPA and NEPA require consideration of the No Action alternative. Thus for this section, there are two alternatives: 1) No Action; and 2) the Proposed Action of the Seagrass Recovery at GUIS, Florida District.

12.2.2.1.1 No Action

The No Action Alternative, inclusion of which is a NEPA requirement, is a viable alternative, and also provides a benchmark, enabling decision-makers to compare the magnitude of environmental effects of the action alternatives (CEQ 1502.14(d)). In this case, the No Action Alternative is to leave the seagrass beds in Naval Live Oaks unit in their current condition. The seagrass beds would likely continue to deteriorate.

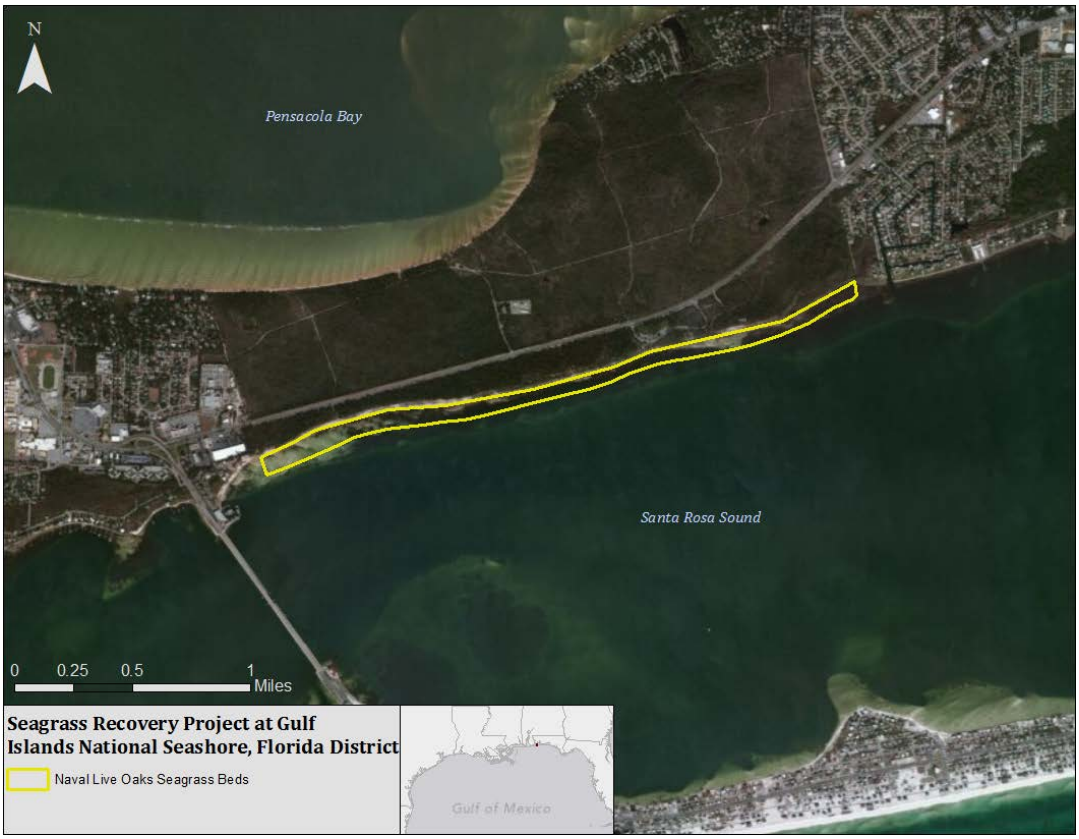
12.2.2.1.2 Proposed Action (NPS Preferred Alternative)

The Proposed Action is the restoration of seagrass beds in GUIS' Naval Live Oaks unit, as described in sections 12.1.1 and 12.1.2. This is the NPS Preferred Alternative because it addresses the issue of declining seagrass beds discussed in the park's General Management Plan (NPS 2011).

12.2.3 Project Location

The proposed project is located in the coastal bays of the Florida panhandle region in the Gulf of Mexico. The specific area targeted for seagrass restoration is the area immediately south of the shoreline of the Naval Live Oaks unit of GUIS in Santa Rosa Sound, Santa Rosa County. Figure 12-2 depicts the proposed project area.

Figure 12-2. Location of the proposed project area in Gulf Islands National Seashore's Florida District, Santa Rosa Sound



12.2.4 Project Scope

Proposed project implementation would involve four specific tasks: seagrass transplanting, installation of bird stakes, education, and monitoring. More detailed descriptions of each task are provided below.

12.2.4.1 Task 1: Seagrass Scar Restoration

Seagrass scarring in the Naval Live Oaks unit would be surveyed and mapped. Prior to seagrass transplant, existing natural resources (e.g. macroalgae, lobster) would be manually removed from the site and relocated to a nearby location away from restoration activities.

Plugs of shoal grass (*Halodule wrightii*) would be harvested from donor sites within the project area and transplanted into the injured areas. Shoal grass is a more preferable transplant species than turtle grass because it is a hardy, fast growing pioneer species of seagrass which helps establish proper site conditions for the eventual colonization of turtle grass. The following BMPswould be adhered to:

- No repeated harvest from donor sites within a calendar year;
- No harvest from high current areas;
- To the maximum extent possible, the environment at the donor site would match conditions at the restored site for salinity, sediment types, tidal current speeds, wave exposure, and temperature;
- The donor beds would be located on shallow, sandy shoals where shoal grass grows at densities of at least 3,000 shoots per square meter;
- Harvest of donor seagrass would be spaced at 3-foot radius intervals from the outer edge of any core taken at a maximum; and
- The maximum core size diameter would not exceed 20 centimeters.

Non-regulatory warning signs would be placed around the restoration area to prevent re-injury to seagrass.

The restoration technique has been scientifically reviewed and supported by NOAA, Florida Fish and Wildlife Conservation Commission (FWC), and the USFWS. Project installation activities would use best management practices (BMPs) including avoidance of existing seagrass habitat through the use of small vessels. The timing of implementation would depend on the timing of funding availability and the contract award, along with any permit constraints required as a result of listed species considerations, but would not occur during the winter months when seagrass transplants would not be likely to establish.

12.2.4.2 Task 2: Installation of Bird Stakes

Seagrass restoration would be facilitated by placing bird stakes, if necessary, in the restoration project area. The stakes would attract perching birds, which then supply natural fertilizer to the restoration area in the form of feces. Bird feces are rich in phosphorus and nitrogen, important nutrients which enhance seagrass growth.

The proposed bird stakes would be constructed of 1.5-inch-diameter polyvinyl chloride (PVC) pipe or similar material, with wooden perches, driven 2 to 3 feet into the sediment via hand-held sledgehammers or fencepost drivers from small, shallow draft vessels in such a way as to minimize bottom disturbance. The perches would remain 20 inches above mean high water elevation in water depths of less than or equal to 60 inches. The bird stakes would be installed as needed parallel to each injured area.

12.2.4.3 Task 3: Monitoring

The project would be monitored for success as described above in section 12.1.4. The complete monitoring plan for this project can be found in Appendix B.

12.2.4.4 Task 4: Education

The proposed boater outreach and education component of the project includes providing educational brochures (Figure 12-3) about best practices for protecting seagrass habitats, as well as separate, non-permanent signage alerting visitors that a seagrass restoration is in progress. Typical signs are 2.5 feet tall by 3 feet wide and are attached either to one or two posts that are driven into the sea floor. The top of the sign should be set 6 feet above the water at mean tide. One or two wayside exhibits may also be installed near where visitors enter the water, explaining the significance and fragility of seagrass, the dangers foot traffic pose to it, and how to avoid impacting it.

12.2.5 Operations and Maintenance

From the point of initiation, the project would be expected to take approximately six months to a year to complete, with the exact start and stop dates being uncertain. This project would incorporate a mix of monitoring efforts to ensure project designs were correctly implemented, and, in a subsequent period defined by contract, where corrective actions could be taken.

12.2.6 Affected Environment and Environmental Consequences

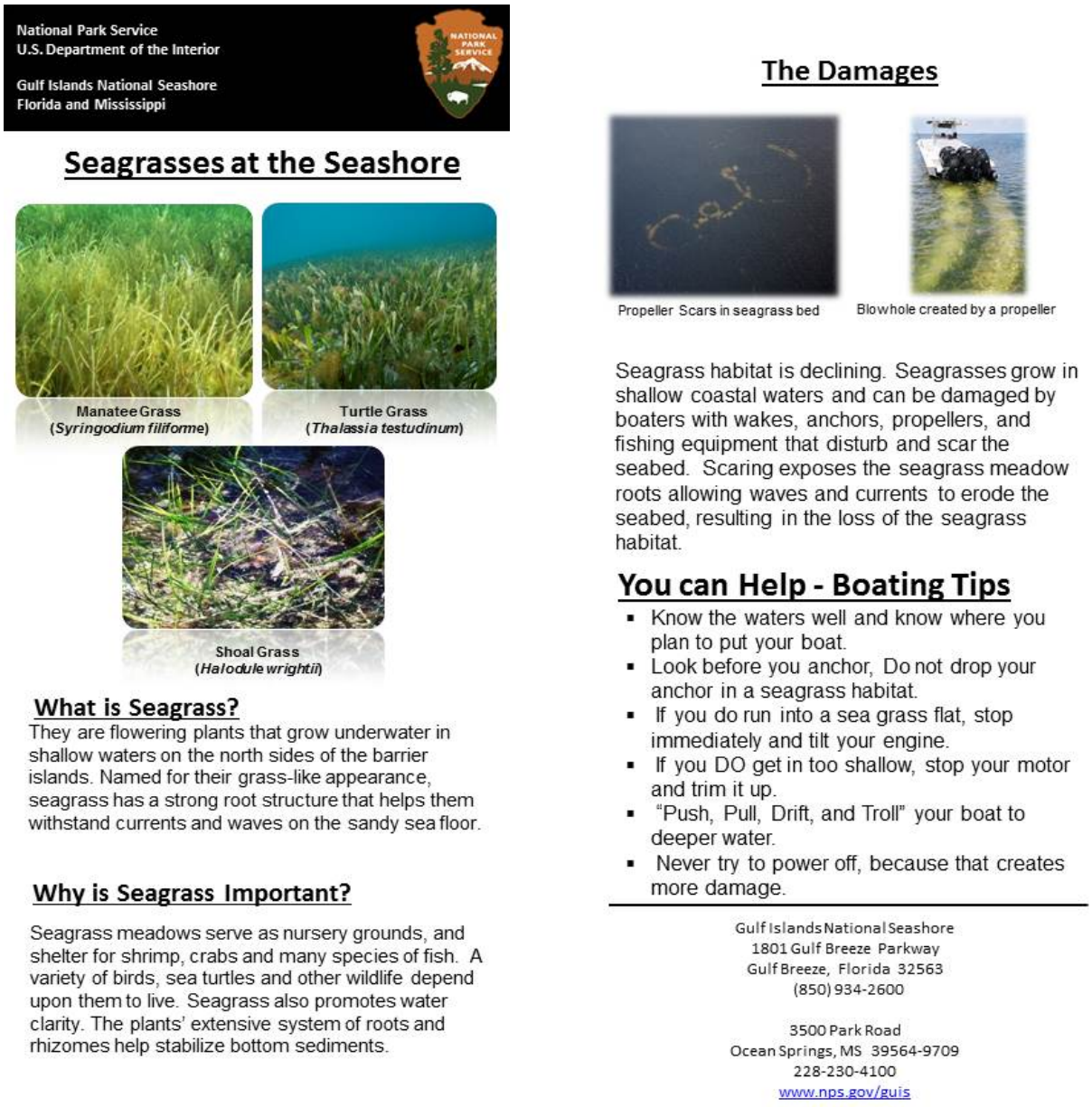
Under NEPA, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

In order to determine whether an action has the potential to result in significant impacts, the **context and intensity** of the action must be considered. **Context** refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). **Intensity** refers to the severity of impact and could include the timing of the action (e.g., more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse.

For purposes of this document, impacts are characterized as minor, moderate or major, and temporary or long-term. The analysis of beneficial impacts focuses on the duration (short- or long-term), without

attempting to specify the intensity of the benefit. The definition of these characterizations is consistent with that used in the Final Phase III ERP/PEIS, and can be found in Appendix D.

Figure 12-3. Educational Seagrass Brochures Currently in Use at Gulf Islands National Seashore's Florida District



The programmatic analysis looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resources that are not expected to be affected are not evaluated further under a given project. Resource areas not analyzed in detail here, along with a brief rationale for non-inclusion, are:

- **Noise –** this project would have very temporary, negligible impacts from noise during seagrass plug placement. The noise generated from project implementation would be virtually indistinguishable from noise from recreational and maritime boating in the project area.
- **Socioeconomics and Environmental Justice –** this project would have a very short-term, negligible impact to the area's socioeconomics during project implementation from wages paid as well as an increase in sales and expenditures for local and regional services, materials, and supplies. This project would not contribute in any way to environmental justice or injustice. The area is not underserved and the project would not cause environmental harm.
- **Infrastructure** – this project would not impact the infrastructure in the project area in any way. There are no roads, utility corridors, or built objects in the project area.
- **Land and Marine Management** – this project would not impact land and marine management. It would require no closures to parks or other protected areas. No changes would occur to the current land use at the Naval Live Oaks unit of GUIS. Land use and management authority of the Seashore would remain under the purview of NPS, and no development at the project site would occur. The proposed project, including the addition of warning signs, would be consistent with existing management and plans at the Seashore.
- **Tourism and Recreational Use** – this project would have no effect on tourism and recreational use. The seagrass in the general project vicinity is relatively robust (approximately 75% cover), allowing plenty of opportunities for visitors who snorkel and boat to experience seagrass beds.
- **Marine Transportation** – this project would not impact marine transportation. It is small enough in scale that it can be accomplished with just one boat, and sufficiently close to shore as to not interfere with marine traffic.
- **Public Health and Safety, Including Flood and Shoreline Protection** – this project would have no impact on public health or safety. It occurs in a very small footprint, underwater, adjacent to non-residential, non-commercial property.

12.2.6.1 Physical Environment

12.2.6.1.1 Geology and Substrates

Affected Resources

In the vicinity of Naval Live Oaks, the coastal plain surface is underlain by a wide belt of mostly fluvial, late Pliocene sediments of the Citronelle formation. At several northwestern Florida locations, Citronelle deposits include interlayered estuarine lenses. When sea level was lower and climate was drier during the late Pleistocene Wisconsin glacial stage, eolian processes formed dunes and sand sheets from reworked sands of older deposits. These dunes and sand sheets cover the Gulfport Formation in the adjacent Florida and Southeastern Alabama mainlands, including the Naval Live Oaks unit of GUIS. The soils at GUIS can be typified as greatly weathered and leached, with little organic material, low natural fertility, and high acidity. Deposits are mostly quartz sand with varying amounts of clay, silt, and shell fragments, depending on the location (NPS 2014). In the Naval Live Oaks unit of GUIS, seagrass

beds and the substrate beneath the vegetation have been injured through propeller scarring, vessel groundings, foot traffic, and damage from anchors.

Environmental Consequences

No Action

Under the No Action Alternative, there would be no new impacts or benefits to substrates or geology from the project, however, when left untreated, propeller scars and blowholes have a tendency to expand in size. Because no action would take place, no mitigation measures would be necessary.

Proposed Action

Sections 6.3.4.1 and 6.7.1.1 of the Final Phase III ERP/PEIS describe the impacts to geology and substrates from early restoration projects intended to restore submerged aquatic vegetation. For this project, geology and substrates were analyzed adequately within the PEIS. The Seagrass Recovery Project at GUIS would have minor, short-term local adverse effects on nearshore sediments due to temporary increase in turbidity during harvest and transplanting of seagrass plugs, and long-term benefits by stabilizing the substrate with vegetation to prevent further disturbance.

The intent of the restoration project is to restore suitable habitat for seagrass recruitment. This project is expected to cause short-term minor impacts to existing submerged substrate and seagrass habitat surrounding the propeller scars due to disturbance during harvest and transplant of seagrass plugs and installation of the bird stakes. However, tidal circulation within the water column is expected to minimize suspended sediments. In addition, there would be an overall long-term benefit of reestablishing seagrass habitat in the damaged sites through improved sediment stabilization once seagrass is established in the restoration areas. The proposed project would encourage seagrass rhizome (root structure) generation from adjacent habitat, thereby stabilizing sediment. Therefore, short-term impacts to existing substrates of the restoration sites and adjacent areas as a result of the proposed project would be expected to be minor. Long-term adverse impacts to existing substrates are not expected as a result of the proposed project. Seagrass plugs would be taken from harvest sites in accordance with established BMPs listed above, and are not anticipated to adversely impact the substrate from which they are harvested.

12.2.6.1.2 Hydrology and Water Quality

Affected Resources

Northwest Florida has seven major watersheds, all of which have been identified as priorities under the Surface Water Management and Improvement (SWIM) program. Water quality protection is the underlying goal of SWIM, along with the preservation and restoration of natural systems and associated public uses and benefits (Northwest Florida Water Management District [NWFWMD] 2011).

Santa Rosa Sound is part of the Pensacola Bay watershed system, which includes a series of interconnected estuaries, including Escambia Bay, Pensacola Bay, Blackwater Bay, East Bay, and Santa Rosa Sound, and three major river systems: The Escambia, Blackwater, and Yellow Rivers. The entire system discharges into the Gulf of Mexico south of Pensacola, Florida (NWFWMD 2011). The system supports a rich and diverse ecology, productive fisheries, and considerable recreational activities. It is an important resource for commercial shipping and military activities. However, point and non-point source pollution, direct habitat destruction, and the cumulative impacts of development and other activities throughout the watershed have combined to degrade the health and productivity of much of the Pensacola Bay system (Thorpe et al. 1997).

Santa Rosa Sound is separated from the Gulf of Mexico by Santa Rosa Island. The sound has a surface area of 42.3 square miles, with a mean depth of 8.9 feet and an average tide fluctuation of about 1.5 feet. Salinity is fairly uniform throughout the sound (mean value of 24 ppt), receiving little fresh water inflow. Extending approximately 58 km east to west and varying in width between 0.32 and 3.5 km, the sound is a lagoon between the mainland and Santa Rosa Island which connects Pensacola Bay in the west with Choctawhatchee Bay in the east. The Intracoastal Waterway transects the sound (Thorpe et al. 1997).

The waters of Santa Rosa Sound are Class II Florida Surface Waters, meaning they are supporting, or have the capability to support, recreational and commercial shellfish propagation and harvesting (Thorpe et al 1997). The waters of the Sound within GUIS are also designated as Outstanding Florida Waters. The Sound is notable as being the site of the most diverse and stable seagrass beds within the Pensacola Bay System (Thorpe et al. 1997).

Environmental Consequences

No Action

Under the No Action alternative there would be no new impacts or benefits to water quality. No project-related actions would create turbidity in the water column, and there would be no new seagrass to contribute to better water quality in the future. No mitigation measures would be necessary.

Proposed Action

Sections 6.3.4.2 and 6.7.2.1 of the Final Phase III ERP/PEIS describe the impacts to hydrology and water quality from early restoration projects intended to restore submerged aquatic vegetation. Section 6.3.4.2 of the PEIS states that negligible local disturbance could result from placement of bird stakes and minor, short-term impacts could occur from nutrient deposition from bird feces. There would be long-term beneficial effects from increased seagrasses via diffusion of storm energy, shoreline stabilization, and sediment trapping.

Project installation activities would use best management practices (BMPs) including impact avoidance of existing seagrass habitat through the use of small vessels. The timing of transplant would depend on the timing of funding availability and the contract award along with any permit constraints required as a

result of listed species considerations, but would not happen during winter. Adverse impacts to hydrology and water quality would be minor, with moderate beneficial impacts expected as a result of restoring seagrass. The intent of the restoration project would be to restore shoal grass to provide suitable habitat for turtle grass recruitment. Short-term turbidity levels above background could result from shoal grass plug harvest and placement. However, tidal current is expected to minimize suspended sediments. Once seagrass planting units are installed and seagrass colonization occurs in the restoration areas, ambient water-quality parameters would be expected to improve by providing enhanced water column filtration and nutrient uptake. Long-term adverse impacts to water quality would not be expected as a result of the proposed project.

In-water work may require authorization from the USACE, pursuant to Section 10 of the Rivers and Harbors Act of 1899, 33 USC 403, and Section 404 of the Clean Water Act 33 USC 1344. The NOAA Restoration Center applied for and secured USACE Permit No. SAJ-2012-01546 (SP-SWA) on January 9, 2013, to implement a similar project in Santa Rosa Sound, as well as other authorized waterbodies. However, USACE Permit No. SAJ-2012-01546 (SP-SWA) does not specifically include the proposed project. Therefore, a modification to Permit No. SAJ-2012-01546 or procurement of a separate USACE permit may be necessary to allow the proposed activity in the Naval Live Oaks area. The existing permit will expire December 20, 2017. No in-water work would be conducted until all permits, authorizations, or amendments are issued by USACE for the work.

12.2.6.1.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

The Clean Air Act (CAA) requires that the Environmental Protection Agency (EPA) set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. NAAQS have been set for six common air pollutants (also known as criteria pollutants), consisting of particle pollution or particulate matter, ozone, carbon monoxide, sulfur dioxide (SO_2), nitrogen dioxide, and lead. Particulate matter is defined as fine particulates with a diameter of 10 micrometers or less (PM_{10}), and fine particulates with a diameter of 2.5 or less ($PM_{2.5}$). When a designated air quality area or airshed in a state exceeds the NAAQS, that area may be designated as a “nonattainment” area. Areas with levels of pollutants below the health-based standard are designated as “attainment” areas. To determine whether an area meets the NAAQS, air monitoring networks have been established and are used to measure ambient air quality. The EPA also regulates 187 hazardous air pollutants (HAPs) that are known or suspected to cause cancer or other serious health impacts. Air quality in the Florida panhandle is in attainment with the NAAQs (EPA 2013).

Greenhouse Gases

Gases that trap heat in the air are called greenhouse gases (GHGs). The primary GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_x), and fluorinated gases. Over the past century, human activities have released large amounts of GHGs into the atmosphere, which are contributing to global

warming. Global warming is defined as the ongoing rise in global average temperature near the Earth's surface and is known to cause changes in climate patterns.

According to the EPA, the average annual temperature in the southeast portion of the United States has increased by approximately 2.0 degree Fahrenheit (°F) since 1970. Winters, in particular, are getting warmer, and the average number of freezing days has decreased by 4 to 7 days per year since the mid-1970s. Most areas are getting wetter; autumn precipitation has increased by 30% since 1901 (EPA 2013b). In many parts of the region, the number of heavy downpours has increased. Despite the increases in fall precipitation, the area affected by moderate and severe drought has increased since the mid-1970s (EPA 2013b).

Average annual temperatures in the region are projected to increase from 4°F to 9°F by 2080. Hurricane-related rainfall is projected to continue to increase. Models suggest that rainfall will arrive in heavier downpours, with increased dry periods between storms. These changes would increase the risk of both flooding and drought. The coasts will likely experience stronger hurricanes and sea level rise. Storm surge could present problems for coastal communities and ecosystems (EPA 2013b).

Total GHG emissions in Florida from 1990 to 2007 have increased at an average rate of 2.1% per year. Total GHG emissions in 2007 were 290 million metric tons of CO_2 equivalents ($MMTCO_2E$). In 2007, 91% of GHG emissions in Florida were CO_2 emissions (FDEP 2010).

Environmental Consequences

No Action

Under the No Action alternative, there would be no impacts to air quality or greenhouse gasses. No boats or trucks would be used, so no emissions would result. No mitigation measures would be necessary.

Proposed Action

Sections 6.3.4.3 and 6.7.3.1 of the Final Phase III ERP/PEIS describe the impacts to air quality and greenhouse gases from early restoration projects intended to restore submerged aquatic vegetation. Section 6.3.4.3 of the PEIS notes that the severity of impacts for this impact topic would be highly dependent on the length and type of construction required and the location of the project. This Seagrass Recovery Project would occur on a very small scale (0.02 acres total) and as such, impacts would be very minor. The use of gasoline or diesel-powered vehicles to access the project site(s) would contribute to a short-term, minor increase in GHG emissions. Available BMPs would be employed to prevent, mitigate, and control potential air pollutants during project implementation. No air quality-related permits would be required.

A boat, truck, and hand tools would be the only construction equipment necessary for the proposed project. The boat and pickup truck would be the only equipment likely to emit GHG emissions. Using the operating assumption of 8 hours per day and 5 days per week for one month, GHG emissions from the boat and pickup truck have been estimated (Table 12-1).

Table 12-1. GHG emissions

EQUIPMENT[1]	NUMBER OF 8-HOUR DAYS	CO_2 (METRIC TONS)[2]	CH_4 (CO_2E) (METRIC TONS)[3]	NO_X (CO_2E) (METRIC TONS)	TOTAL CO_2E (METRIC TONS)
Boat	20	0.13	0.004	0.052	0.186
Pickup Truck	20	0.22	0.07	0.88	1.17
TOTAL		0.35	0.074	0.932	1.356

[1] Emissions assumptions for all equipment are based on 8 hours of operation.
[2] CO_2 emissions assumptions for diesel and gasoline engines are based on EPA 2009.
[3] CH_4 and NO_x emissions assumptions and CO_2e calculations are based on EPA 2011.
[4] Emissions assumptions 0for an 8-cylinder, 6.2-liter gasoline engine Ford F150 pickup based on DOE 2013 and 18-gallon (half-tank) daily fuel consumption.

Overall, impacts to air quality would be very minor and short term.

12.2.6.2 Summary of Impacts to the Physical Environment

Impacts to the physical environment from implementation of the Seagrass Recovery Project would include:

- Geology and Substrates: There would be very minor, short-term adverse impacts due to soil disturbance during project implementation, and long-term benefits from a more stabilized substrate after project completion.
- Hydrology and Water Quality: There would be very minor, short-term adverse impacts from soil disturbance and its resultant turbidity during project implementation, and long-term benefits from successful project implementation as seagrasses reestablish.
- Air Quality and Greenhouse Gasses: There would be very minor, short-term adverse impacts from boat traffic during project implementation. There would be no long-term adverse impacts or benefits on air quality and greenhouse gasses from this project.

12.2.6.3 Biological Environment

12.2.6.3.1 Living Coastal and Marine Resources

Section 6.3.4.6 of the Final Phase III ERP/PEIS describes the potential impacts to living coastal and marine resources from early restoration projects intended to restore submerged aquatic vegetation. Section 6.3.4.6 of the PEIS states that this project type would expand the amount of available habitat, creating a long-term beneficial effect to coastal and marine resources. Short-term, minor impacts would result from the activity, noise, vibration, turbidity, and loss of foraging habitat associated with SAV restoration implementation. However, these impacts would be temporary and would dissipate quickly.

Section 6.7.6.1 of the Final Phase III ERP/PEIS describes the range of direct and indirect impacts of its Preferred Alternative on living coastal and marine resources. The Final Phase III ERP/PEIS Preferred Alternative includes restoring submerged aquatic vegetation as well as other project types intended to

restore habitats and living coastal and marine resources, and to provide and enhance recreational opportunities. The analysis below breaks the discussion of the affected biological environment and the potential environmental consequences of the proposed Seagrass Recovery Project into the following subsections:

- Vegetation
- Wildlife habitat
- Marine and estuarine fauna
- Protected species

Vegetation

Affected Resources

Santa Rosa Sound is designated by the State of Florida as an Outstanding Florida Water for its known natural resources occurrences and regional ecological significance. Seagrass communities characterize the SAV of the project area. In addition, the adjacent shoreline in the proposed project location includes a mix of mature live oak forest and sandy beach habitat.

The seagrass communities of the Naval Live Oaks unit are dominated by turtle grass, which is the target restoration species for the project. Seagrass communities are essential breeding, rearing, and feeding grounds for many important recreational and commercial fisheries as well as wildlife, including the endangered West Indian manatee (*Trichechus manatus latirostris*) and various species of sea turtles.

Environmental Consequences

No Action

Under the No Action alternative, there would be no new impacts or benefits to the vegetation of the area. If not restored, the damaged seagrass habitat would continue to erode and impact more of the healthy habitat surrounding the injured areas. No mitigation measures would be necessary.

Proposed Action

During harvest and transplant of shoal grass plugs, potential short-term impacts would be expected and would include temporary damage to donor shoal grass beds and inadvertent damage to vegetation during restoration. Every effort would be made to access the restoration sites during periods of high tide using shallow draft vessels to avoid potential adverse impacts to seagrass habitat as a result of navigation. At the harvest site, shoal grass would be anticipated to quickly recolonize the small areas where donor plugs are removed. Shoal grass was chosen for this project because of the species' ready colonization and pioneer characteristics. Therefore, impacts to shoal grass at the harvest site would be temporary and negligible. The long-term benefits of the seagrass recovery effort would outweigh potential temporary adverse impacts, and include restoration of this community type, water quality enhancement, and increased habitat for commercial and recreational fisheries.

The FDEP would require permits and impose reasonable conditions as are necessary to ensure that project implementation would comply with the provisions of Chapter 62-346.050 (3) of the Florida Administrative Code (FAC), which states in part that dredging and filling in, on, or over surface waters of the state remains subject to the requirements of FAC Chapter 62–312, including the need to obtain a separate permit under that chapter until the effective date of the rules adopted under Section 373.4145(1)(b), Florida Statutes (FS). The FDEP permit also grants state-owned Submerged Lands Authorization from the Board of Trustees of the Internal Improvement Trust Fund, pursuant to Article X, Section 11 of the Florida Constitution, and Section 253.77, F.S. This permit also would constitute a finding of consistency with Florida's Coastal Zone Management Program (FCMP), as required by Section 307 of the Coastal Management Act, and a water quality certification under Section 401 of the Clean Water Act, 33 U.S.C., 1341. This permit is applied for with the same application as the USACE permit.

Pursuant to the Coastal Zone Management Act of 1972, federal actions must be consistent with the federally approved coastal management programs for states where the activities would affect a coastal use or resource of the state. The Federal Trustees' consistency determination for this project was submitted to the FDEP on May 21, 2015. The FDEP responded by letter dated July 10, 2015 advising that, based on the information contained in the Draft Phase IV ERP/EA and the coordinated state agency staff review, the state had determined that, at this stage, the proposed activities are consistent with the FCMP. As noted in that response, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in Florida, as may be applicable."

On August 17, 2012, the NOAA Restoration Center secured FDEP Environmental Resource Permit No. 17-0312090-001-EI to construct a similar project in Santa Rosa Sound as well as at other authorized waterbodies. However, FDEP Permit No. 17-0312090-001-EI does not specifically include the currently proposed construction, and the permit was issued to NOAA. Therefore, a permit modification to FDEP Permit No. 17-0312090-001-EI or a procurement of separate FDEP permit may be necessary to allow the proposed activity. The existing FDEP permit will expire August 17, 2017.

The potential introduction of terrestrial and aquatic non-native invasive species of plants, animals, and microbes is a concern for any proposed project. Non-native invasive species could alter existing terrestrial or aquatic ecosystems, may cause economic damages and losses, and are the second most common reason for protecting species under the ESA. The species that are or may become introduced, established, and invasive are difficult to identify. The analysis focuses on pathway control or actions/mechanisms that may be taken or implemented to prevent the spread of invasive species on site or introduction of species to the site.

This project involves the use of boats and hand tools as well as the placement of bird stakes and temporary signage. Each of these actions and pieces of equipment serve as a potential pathway to introduce or spread invasive species. BMPs would be implemented to ensure these pathways are "broken" and do not spread or introduce species (See BMPs listed below). The implementation of these BMPs meets the spirit and intent of EO 13112. Due to the implementation of BMPs, the Trustees expect risk from invasive species introduction and spread to be short-term and minor. The Final Phase III ERP/PEIS provided mitigation measures in

Appendix 6A. The following mitigation measures and environmental review would result in the avoidance and minimization of the introduction and spread of invasive species:

- All equipment to be used during the project, including personal gear, would be inspected and cleaned such that there is no observable presence of mud, seeds, vegetation, insects and other species.

Wildlife Habitat

Affected Resources

Santa Rosa Sound provides crucial nursery and forage habitat for many commercial and recreational fisheries and wildlife, including marine and estuarine invertebrates, wading birds (herons and egrets), and birds of prey that feed on juvenile and adult fish (FDEP 2008). Protected wildlife (such as sea turtles, dolphins, and manatee, discussed in detail below) also forage on or within seagrass communities at the project site.

Environmental Consequences

No Action

Under the No Action alternative, there would be no new impacts to wildlife habitat. If not restored, there would be no increase in the seagrass bed area at Naval Live Oaks, and therefore there would be no new habitat for wildlife utilization. No mitigation measures would be necessary.

Proposed Action

Section 6.3.4.5 of the Final Phase III ERP/PEIS describes the potential impacts to habitat from early restoration projects intended to restore submerged aquatic vegetation, stating that this project type would be expected to enhance adjacent wetland, barrier island, beach, or other coastal habitats, and over the long term, SAV restoration could improve water quality. "Temporary adverse effects could result from short-term increases in sediment disturbance and turbidity associated with in-water activities such as SAV planting and fertilization, but this would be expected to settle quickly and be limited to the localized area where restoration activities occurred."

The proposed project would likely result in short-term minor impacts due to turbidity resulting from the harvest and transplant of shoal grass. This turbidity would be extremely localized, and any wildlife that uses the seagrass as habitat would likely move to a more suitable location to continue foraging or feeding. There would be long-term beneficial effects to wildlife habitat from the restoration of seagrass because it would provide animals who utilize seagrass habitat more area in which to forage, loaf, and feed.

Marine and Estuarine Fauna (Fish, Shell Beds, and Benthic Organisms)

Affected Resources

A number of aquatic species are found in the project area. More than 200 species of fish occur within the waters of GUIS (NPS 2014). Myriad larval and young fish occupy shallow waters around the islands and find food and protection in the seagrass beds. Several commercially and recreationally important species are within the waters of the National Seashore, including speckled sea trout, kingfish, jack, flounder, mackerel, and snapper. Cobia, tarpon, mullet, rays, and several species of sharks are also present. Benthic organisms such as bivalves, gastropods and other mollusks, anemones, amphipods, annelids, crustaceans, and echinoderms are also abundant in these waters.

Environmental Consequences

No Action

Under the No Action alternative, seagrass would not be restored. There would be no new impacts or benefits to seagrass. Any wildlife which utilizes seagrass as habitat or as a food source would not be benefited by increased availability of seagrass in the area. No mitigation measures would be necessary.

Proposed Action

The proposed project would likely result in temporary minor impacts due to harvest and transplant placement of shoal grass plugs. Invertebrates or sessile organisms may have established themselves and be present. Small fish that may seek protection in the scars are highly mobile and would be displaced to more suitable habitat in the project area. In addition, fish and sessile invertebrates occupying the submerged substrate may be disturbed or displaced in the short term from areas where bird stakes would be placed. However, these species are numerous in Gulf of Mexico waters and typically recolonize quickly.

The proposed project would result in long-term benefits to marine and estuarine fauna by providing additional fish habitat, increased benthic productivity, and enhanced recruitment and production of fish and crustaceans. Restoration of the seagrass habitat would benefit numerous aquatic species, including but not limited to blue crab (*Callinectes sapidus*), red drum (*Sciaenops ocellatus*), and speckled sea trout (*Cynoscion nebulosus*). Over the life of the project, the quality of the aquatic habitat would increase. The overall benefits to marine habitats that would result from seagrass restoration would outweigh potential short-term impacts to these species and their habitats.

During in-water work periods, the *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006) and *Standard Manatee Conditions for In-Water Work* (USFWS 2011) would be implemented to minimize risks/impacts to aquatic species. Those conditions are listed below in the Environmental Consequences portion of the Protected Species section (12.2.6.3.2).

12.2.6.3.2 Protected Species

Affected Resources

The USFWS and NOAA lists species as threatened or endangered when they meet criteria detailed under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. §§1531 et seq.). Section 7(a)(2) of the ESA requires that each federal agency ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of those species. When the action of a federal agency may affect a protected species or its critical habitat, that agency is required to consult with either the NMFS or the USFWS, depending upon the protected species that may be affected. ESA Section 7 consultations have been conducted and the appropriate recommendations incorporated into the proposed project.

Protected species and their habitats include ESA-listed species and designated critical habitats, which are regulated by either the USFWS or the NMFS. Protected species also include marine mammals protected under the Marine Mammal Protection Act, essential fish habitat protected under the Magnuson-Stevens Fishery Conservation and Management Act, migratory birds protected under the MBTA and bald eagles protected under the BGEPA.

The federally listed threatened and endangered species reported for the project area in Escambia and Santa Rosa Counties, and which are likely to occur in the project area, include five species of sea turtles, West Indian manatee, piping plover, red knot, and Gulf sturgeon (USFWS 2013a).

The Trustees have reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS and NOAA. The Trustees reviewed the species list for Escambia and Santa Rosa counties, Florida[1]. Table 12-2 presents a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation. ESA and Marine Mammal Protection Act Consultations with USFWS and NOAA have been completed. Appropriate recommendations would be incorporated into the proposed project. An EFH consultation with NOAA was completed on June 19, 2015 (NMFS 2015).

[1] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded February 18, 2015.

Table 12-2. Potential Impacts to Species/Critical Habitats managed by USFWS

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle, Hawksbill turtle, Kemp's ridley turtle; Leatherback turtle, Loggerhead turtle	No work would occur in the terrestrial environment; therefore no impacts would occur to sea turtle species in the terrestrial environment. The main risk to sea turtles during implementation of this project would come from boat collisions which could result in harm or mortality. Sea turtles could be present in the project waters and would potentially seek out shallow seagrass areas as they are preferred feeding habitat. Turbidity of the water may increase during project completion. We expect sea turtles to naturally avoid any areas of increased turbidity as they are not known to use turbid habitats. We do not expect this avoidance of the Action area to result in changes to normal behaviors. Conservations measures should reduce the potential risks to sea turtles from in-water work to an insignificant and discountable level.
West Indian manatee	The main risk to manatees during implementation of this project would come from boat collisions which could result in harm or mortality. The overall goal of the project is to improve the quantity and quality of the seagrass habitat that manatees prefer. Manatees could be present in the project waters and would potentially seek out shallow seagrass areas as they are preferred feeding habitat (U.S. Department of the Interior, 2011). Turbidity of the water may increase during project completion. We expect West Indian manatee to naturally avoid any areas of increased turbidity as they are not known to use turbid habitats. We do not expect this avoidance of the Action area to result in changes to normal behaviors. Conservations measures should reduce the potential risks to manatees from in-water work to an insignificant and discountable level.
Piping plover and Red knot	No Effect is anticipated on these species because the project would take place in water, and the staging would take place from established boat ramps in the Gulf Breeze area. Noise from the project may reach the shore, but we do not anticipate the noise to startle birds. Additionally, red knots and piping plovers are not known to utilize the small beach areas in the project vicinity. Since the project would not take place on shore, we do not anticipate these species to be affected.
Gulf sturgeon	Gulf sturgeon is a highly mobile species that utilizes riverine, estuarine, and marine habitats throughout its lifecycle. Turbidity of the water may increase during project completion and the noise from the boats may affect species within the area. If transiting the area, Gulf sturgeon could be startled by in-water work or have difficulty navigating due to turbidity. We expect Gulf sturgeon to naturally avoid any areas of increased turbidity as they are not known to use turbid habitats. We do not expect this avoidance of the project area to result in changes to normal behaviors. Conservation measures should reduce the potential risks to Gulf sturgeon from in-water work to an insignificant and discountable level. The applicable PCE's for Gulf sturgeon in estuarine environments include 1) abundant food items, 5) appropriate water quality, 6) appropriate sediment quality, and 7) safe and unobstructed migratory pathways.

SPECIES/CRITICAL	SPECIES/CRITICAL HABITAT IMPACTS
	No long-term impacts to Gulf sturgeon's critical habitat or PCE's are expected because of this project. There may be a temporary increase in turbidity, as well as changes in food abundance and water quality during project completion. However, these changes would be temporary and extremely localized and would not affect the open waters of Santa Rosa Sound. Conservation measures would be implemented to ensure this project has no effect on Gulf sturgeon critical habitat.

Additional information for some of the species listed above is provided below.

Sea Turtles and Marine Mammals

Five species of endangered or threatened sea turtles may occur or have potential to occur in the project areas. These are the green turtle, hawksbill turtle, Kemp's ridley turtle, leatherback turtle, and loggerhead turtle. Sea turtles forage in the waters of the coastal Florida panhandle region and are likely to occur in the project area.

The endangered West Indian manatee has the potential to occur in project area waters and seek out shallow seagrass areas as preferred feeding habitat, and it is known to occur in the Santa Rosa Sound.

Gulf Sturgeon and Gulf Sturgeon Critical Habitat

Gulf sturgeon are restricted to the Gulf of Mexico and its drainages, occurring primarily from the Pearl River in Louisiana to the Suwannee River, in Florida (NMFS 2009). Adult fish reside in rivers for 8 to 9 months each year and in estuarine or Gulf of Mexico waters during the 3 to 4 cooler months of each year (NMFS 2009). Important marine habitats include seagrass beds with sand and mud substrates (Mason and Clugston 1993).

Gulf sturgeon critical habitat was jointly designated by the NMFS and USFWS on April 18, 2003 (50 Code of Federal Regulations [C.F.R.] 226.214). The proposed project area is located within the Florida Santa Rosa Sound Critical Habitat Unit 10, which was designated as critical habitat because it is believed the sound provides one continuous migratory pathway between Choctawhatchee Bay, Pensacola Bay, and the Gulf of Mexico for feeding and genetic interchange. Critical habitat was designated based on seven primary constituent elements essential for Gulf sturgeon conservation, as defined in the 2003 *Federal Register*.

These seven elements are listed below. PCEs 1, 5, 6, and 7 are present in the project area.

1. Abundant food items such as detritus, aquatic insects, worms, and/or mollusks, within riverine habitats for larval and juvenile life stages; and abundant prey items such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages.

2. Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay.

3. Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, and generally but not always located in holes below normal riverbed depths, believed necessary for minimizing energy expenditures during fresh water residency and possibly for osmoregulatory functions.

4. A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging.

5. Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages.

6. Sediment quality, including texture and chemical characteristics necessary for normal behavior, growth, and viability of all life stages.

7. Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., an unobstructed river or a dammed river that still allows for passage).

Figure 12-4shows Gulf sturgeon critical habitat areas in relation to the potential project locations. Gulf Sturgeon critical habitat is within the project area.

Figure 12-4. Gulf Sturgeon Critical Habitat in the Naval Live Oaks Unit of Gulf Islands National Seashore's Florida District



Essential Fish Habitat (EFH)

The 1996 Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) requires cooperation among NOAA Fisheries, anglers, and federal and state agencies to protect, conserve, and enhance Essential Fish Habitat (EFH). EFH is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. NOAA's Estuarine Living Marine Resources Program developed a database on the distribution, relative abundance, and life history characteristics of ecologically and economically important fishes and invertebrates in the nation's estuaries. NOAA has designated EFH for more than 30 estuaries in the northern Gulf of Mexico for a number of species of finfish and shellfish. EFH consists of the following waters and substrate areas in the Gulf of Mexico (GMFMC 2005,) and the project area: estuarine water columns for species of fish, such as sharks, red drum, trigger fishes, jacks, wrasses, snappers, groupers, tilefishes, and coastal pelagics, as well as brown shrimp, pink shrimp, and white shrimp. There are no Habitat Areas of Particular Concern or EFH Areas Protected from Fishing in the project vicinity.

Piping Plover

There are numerous sandy beaches and shorelines within 1-2 miles of the project area which offer suitable foraging and resting habitat for the piping plover during the winter migratory season, and piping plover may forage in the shallow waters of the project area. Natural shorelines in the proposed project vicinity provide suitable winter migration resting habitat for the piping plover. Piping plover wintering habitat includes beaches, mudflats, and sandflats, as well as barrier island beaches and spoil islands (Haig 1992, as cited by USFWS, accessed September 30, 2013). On the Gulf Coast, preferred foraging areas were associated with wider beaches, mudflats, and small inlets (USFWS 2013a). No piping plover critical habitat is located in the project area.

Red Knot

The red knot, a federally threatened species, uses the state of Florida both for wintering habitat and migration stopover habitat for those that continue to migrate to specific wintering locations in South America (Niles et al. 2008). Wintering and migrating red knots forage along sandy beaches, tidal mudflats, saltmarshes, and peat banks (Harrington 2001). Observations indicate that red knots also forage on oyster reef and exposed bay bottoms, and roost on high sand flats, reefs, and other sites protected from high tides (Niles et al. 2008). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Threats to wintering and stopover habitat in Florida include shoreline development, hardening, dredging, deposition, and beach raking (Niles et al. 2008).

State-Listed Birds, MBTA and BGEPA

The proposed project was also reviewed for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), respectively. Table 12-3 provides a summary of the different migratory bird groups specifically addressed by this review and summarizes the potential impacts to these groups and associated habitats that could result from the implementation of this project.

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) of 1940 (BGEPA) prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. BGEPA provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." Golden eagles are not present along the Gulf Coast.

The Trustees have reviewed the project site and determined that migratory bird nesting is not known or likely as the work would occur in-water, although some migratory birds may nest in the vicinity of the project. The MBTA requires the protection of all migratory bird species and protection of ecosystems of special importance to migratory birds against detrimental alteration, pollution, and other environmental degradation. Coordination under MBTA is ongoing between the Trustees and the U.S. Fish and Wildlife Service.

There are numerous birds protected by the MBTA and the State of Florida with potential to occur in and around the seagrass restoration sites. These include the peregrine falcon (*Falco peregrinus*), American kestrel (*Falco sparverius*), snowy plover (*Charadrius alexandrinus*), piping plover (discussed above), and red knot (discussed above). GUIS species lists indicate numerous state-listed birds as well as bird species of special concern that are known to occur in the project area.

While ospreys are known to nest in the vicinity of the project area, bald eagles are not. Bald eagles and osprey feed on fish and other readily available mammalian and avian species, and are dependent on large, open expanses of water for foraging habitat.

Table 12-3. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, roosting	Seabirds forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily roost in the dunes. Therefore the Trustees do not anticipate impacts.
Shorebirds	Foraging, feeding, resting, roosting	Shorebirds are likely to be present conducting all routine behaviors in the general project vicinity. As such they may be impacted locally and temporally by the project. Foraging may occur along the shoreline near the project area. However it is expected that birds would move to another nearby location to continue foraging, feeding, and resting if disturbed by the noise. These birds primarily nest and roost in the dunes rather than at the boat ramps that would be used for access.

Environmental Consequences

No Action

Under the No Action alternative, there would be no new impacts or benefits to protected species. Protected species who utilize seagrass beds would not experience short-term, minor impacts from turbidity during project implementation, and they would not benefit in the future from increased seagrass bed area in the project vicinity. No mitigation measures would be necessary.

Proposed Action

The proposed project restoration activities would restore seagrass habitat that many protected species rely on for forage, refuge, and nursery areas essential for the marine and estuarine ecosystems of GUIS

and nearby Gulf of Mexico waters. The proposed project has been evaluated for potential short- and long-term impacts to state-listed and federally listed threatened and endangered species that may occur in and adjacent to the project areas, based on available suitable habitat and restoration goals. Table 12-4 lists conservation measures that would be implemented to reduce impacts to protected species. Descriptions of the evaluation for these species are provided below.

Table 12-4. Explanation of actions (conservation measures) to be implemented to reduce impacts to protected species

SPECIES/CRITICAL HABITAT	ACTIONS TO MINIMIZE IMPACTS
Gulf Sturgeon	• The Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) would be implemented as applicable to protect Gulf sturgeon. • Instruct all personnel associated with the project in the potential presence of Gulf sturgeon. Furthermore, inform the project personnel of the civil and criminal penalties for harming, harassing, or killing species that are protected. • Keep noise low (in air and in water) to the greatest extent possible. • Care shall be taken in lowering equipment or material below the water surface and into the sediment. These precautions would be taken to ensure no harm occurs to any sturgeon which may have entered the project area undetected. • In the unlikely event that a protected Gulf sturgeon approaches any near-shore areas of the proposed project, work would immediately cease until the sturgeon moves away from the area on its own volition.
Sea Turtles (Loggerhead Turtle, Green Sea Turtle, Leatherback Turtle, Hawksbill Sea Turtle, Kemp's Ridley Sea Turtle)	• The Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006), listed below, would be implemented as applicable to protect in-water sea turtles. • Vehicles and equipment would be driven to avoid nests by a minimum of 10 feet. • All personnel would be notified of the potential presence of sea turtles both on the beach and in the water and would be reminded of the need to avoid sea turtles. • All personnel would be notified of the criminal and civil penalties associated with harassing, injuring, or killing sea turtles. • All personnel would be trained/instructed as to what they are to do in the presence of a sea turtle. • Project activities would occur during daylight hours and noise would be kept to the minimum feasible.
Piping Plover and Red Knot	• If piping plovers or red knots are present, work would not occur until the birds have moved from the area by 150 feet.
West Indian manatee	• Standard Manatee Conditions for In-Water Work (FWS 2011), listed below, would be followed.

Sea Turtles and Marine Mammals

For projects in waters accessible to sea turtles, NMFS has developed standardized *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS 2006). These conditions, listed below, are typically applied to projects as part of the Clean Water Act Section 404 permit issued for in-water work. To minimize risks in the aquatic environment, all construction conditions identified in the *Sea Turtle and Smalltooth Construction Conditions* would be implemented and adhered to during project construction to minimize the risk of collisions. Because of adherence to the measures below, we anticipate that this project would have no effect on sea turtles of any species.

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

The permittee shall comply with the following protected species construction conditions:

a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.

b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.

c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.

d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels would preferentially follow deep-water routes (e.g., marked channels) whenever possible.

e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.

f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.

g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, would be addressed in the primary consultation.

Noise and other activity associated with proposed in-water work may temporarily disturb manatees and dolphin species in the vicinity of the project area through temporary impacts on prey abundance, water quality (turbidity), and underwater noise. *Standard Manatee Conditions for In-Water Work* (USFWS 2011), listed below, would be implemented and adhered to during project construction. It is anticipated that these conservation measures would minimize impacts to temporary and minor if manatees are present in the proposed project area. Dolphins are highly mobile species and would be expected to

move away from the construction area during in-water activities. Because of adherence to the measures below, we anticipate this project may affect, but would not be likely to adversely affect manatees.

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK, 2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels would follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shut down if a manatee(s) comes within 50 feet of the operation. Activities would not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or in Vero Beach (1-772-562-3909) for south Florida, and emailed to FWC at ImperiledSpecies@myFWC.com.

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads Caution: Boaters must be posted. A second sign measuring at least 8½ " by 11" explaining the requirements for "Idle Speed/No Wake" and the shutdown of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related

activities. These signs can be viewed at
http://www.myfwc.com/wildlifehabitats/managed/manatee/signs/sign-vendors/

Questions concerning these signs can be forwarded to the email address listed above.

Gulf Sturgeon and Gulf Sturgeon Critical Habitat

If transiting the area, Gulf sturgeon could be startled by in-water work or have difficulty navigating due to turbidity. We expect Gulf sturgeon to naturally avoid any areas of increased turbidity as they are not known to use turbid habitats. We do not expect this avoidance of the project area to result in changes to normal behaviors. Conservation measures in Table 12-4 should reduce any impacts to Gulf sturgeon from in-water work to only short-term, minor impacts.

No long-term impacts to Gulf sturgeon's critical habitat or PCEs are expected from this project. There may be a temporary increase in turbidity, as well as changes in food abundance and water quality at the project site during project implementation but not throughout the critical habitat unit. These changes would be temporary and extremely localized and would not affect the open waters of Santa Rosa Sound. Conservation measures (see Table 12-4) would be implemented to ensure this project has no impacts to Gulf sturgeon critical habitat. Because of nearby suitable habitat and the ability to properly implement these conservation measures, the Trustees have determined this project may affect, but would not be likely to adversely affect Gulf sturgeon. It would have no effect on Gulf sturgeon critical habitat.

Piping Plover and Red Knot

Although they could use the area for foraging and roosting, piping plover and red knot are not expected to be in the project area. Negligible to short term, minor impacts to these species are anticipated because the project would take place in water, and the staging would take place from established boat ramps in the Gulf Breeze area. Noise from the project may reach the shore, but we do not anticipate the noise to startle birds. Since the project would not take place on shore, the Trustees have determined that the proposed project would have no effect on piping plover and red knot.

State-Listed Birds, MBTA and BGEPA

Migratory birds may nest, forage, and/or rest on beaches or mudflats in the vicinity of seagrass restoration activities. If seagrass restoration occurs during the nesting season (February 15 to August 13), these birds could be disturbed by noise generated from in-water activities. This would be a short-term minor impact. To avoid this impact, work within 300 feet of suitable nesting habitat would be avoided during the nesting season. If project implementation could not avoid the nesting season, a pre-project survey would be conducted by a qualified biologist, and if nesting birds were identified within 300 feet of project activities, the USFWS would be contacted regarding the placement of appropriate buffers to ensure no impacts to nesting birds would occur. Contractors would be required to be aware of and comply with applicable laws prohibiting harm to migratory birds and endangered species.

The project is proposed to occur in open water near the shoreline. Open-water seagrass restoration activities would include in-water work that could disturb seabirds or other wildlife due to turbidity,

acoustical vibration, and noise impacts during project implementation by small draft vessels, outboard engine operation, and hammering impacts during installation of the bird stakes or signs. Avoidance and minimization measures to prevent impacts to these migratory birds include minimizing noise and vibration near areas where foraging or resting birds were encountered (USFWS 2013a). All disturbances would be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Additionally, foraging habitat is abundant near the restoration site, and the seagrass restoration activities would take place in only a small portion of the area. Therefore, foraging birds or other wildlife would not be impacted as a result of seagrass restoration activities. Roosting should not be impacted because the project would occur during daylight hours only. Nesting would not be impacted because the project would be limited to open water areas.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, conservation measures were identified and would be followed to minimize potential impacts. These measures are summarized in Table 12-5.

Table 12-5. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care would be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbances would be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project would occur during daylight hours only. Nesting would not be impacted because the project is limited to open water areas.
Shorebirds	Care would be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbances would be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project would occur during daylight hours only. Should nesting birds be discovered in the boat ramp areas, nesting would not be impacted because the following measures would be implemented. Nesting Shorebirds: • All personnel would be notified of the potential presence of nesting shorebirds and seabirds within the project area. • All personnel would be instructed and trained in the protection of shorebirds and seabirds. • Activities would be conducted in accordance with the Florida Fish and Wildlife Conservation Commission's guidelines developed to protect nesting shorebirds. • Personnel would be notified of the criminal and civil penalties associated with harassing, injuring, or killing shorebirds and seabirds. • Noise would be kept to the minimum feasible.

Bald eagles are not known to nest near the Naval Live Oaks unit of the Seashore (personal communication with District Biologist Nicholas, 2/19/2015). If bald eagle breeding or nesting behaviors are observed, or an active nest is determined to be within the project vicinity, conservation measures from USFWS would be implemented to avoid impacts to breeding and nesting bald eagles. To minimize potential for impacts to nesting bald eagles, consultation protection measures may include 1) addressing prescribed nest tree protection zones, and 2) preparation of a bald eagle nest protection plan (including nesting behavior disturbance monitoring). Bald eagles have been known to be tolerant of certain potential disturbances within their breeding territories. Should these conservation measures be implemented for active nest sites adjacent to restoration activities in the Naval Live Oaks project area, potential impacts to the bald eagle would be short term and minor.

Bald eagles and ospreys are not present at the proposed project location within a distance that would require conservation measures so they would not be affected. At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds would prevent take of the identified migratory bird groups.

In May 2015, the Trustees requested concurrence from USFWS and NOAA regarding these ESA determinations (DOI 2015). The U.S. Fish and Wildlife Service provided concurrence with this determination on May 21, 2015 (USFWS 2015) and NOAA's Restoration Center determined No Effect on August 14, 2015 (NFMS 2015b). The Trustees have completed coordination and reviews under the Marine Mammal Protection Act and determined that this project does not require authorization under the MMPA. Consultation with NOAA's Habitat Conservation Division with respect to MSFCMA was also initiated in May 2015, and on June 19, 2015, NMFS concluded that the project would have only minimal temporary EFH impacts (NMFS 2015).

12.2.6.4 Summary of Impacts to Biological Resources

Impacts to biological resources from the implementation of the Seagrass Recovery Project would be as follows:

- Vegetation: This project would have temporary and negligible impacts to donor shoal grass beds from inadvertent damage to vegetation during restoration. The long-term benefits of the seagrass recovery effort would outweigh potential temporary adverse impacts, and include restoration of this community type, water quality enhancement, and increased habitat for commercial and recreational fisheries;
- Wildlife Habitat: The proposed project would likely result in short-term minor impacts to wildlife habitat due to turbidity resulting from the harvest and transplant of shoal grass. This turbidity would be extremely localized, and any wildlife that uses the seagrass as habitat would likely move to a more suitable location to continue foraging or feeding. There would be long-term beneficial effects to wildlife habitat from the restoration of seagrass because it would provide animals who utilize seagrass habitat more area in which to forage, loaf, and feed;
- Marine and Estuarine Fauna: The proposed project would likely result in temporary, minor impacts due to harvest and transplant placement of shoal grass plugs. The proposed project

would result in long-term benefits to marine and estuarine fauna by providing additional fish habitat, increased benthic productivity, and enhanced recruitment and production of fish and crustaceans; and

- Protected Species: This project would be anticipated to have no effect piping plover, red knots, or any other birds protected under the MBTA and the BGEPA because these species would not be anticipated to utilize the project area. Because of adherence to the conservation measures found in Table 12-4 and Table 12-5, this project would be anticipated to have no effect on sea turtles or gulf sturgeon critical habitat. This project may affect, but would not be likely to adversely affect, Gulf sturgeon and West Indian manatee.

12.2.6.5 Human Uses and Socioeconomics

12.2.6.5.1 Cultural Resources

Affected Resources

Cultural resources include historic properties listed in, or eligible for listing in the National Register of Historic Places (36 C.F.R. §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]." The definition of historic properties also includes significant traditional religious and cultural properties important to Indian tribes. Historic properties include built resources (bridges, buildings, piers, etc.), archaeological 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 include submerged resources.

Previously recorded archaeological sites, shipwrecks, ruins and obstructions were reviewed. The review of the previously recorded archaeological sites using Florida Bureau of Historic Preservation (FBHP) records revealed that there are several Native American archaeological sites adjacent to the project area that may have components that are now submerged due to past erosion.

Environmental Consequences

No Action

Under the No Action alternative, there would be no impacts to cultural resources. No actions would be taken in the project area, so no impacts to the cultural and historical resources would occur. No mitigation measures would be necessary.

Proposed Action

This project is anticipated to be minimally invasive. Only hand tools would be used for seagrass harvest and transplant, which would minimize ground disturbance to the greatest extent possible. Because of

the very small footprint of the project, the actions taken to minimize ground disturbance, the extensive existing maps of the cultural and historic resources in the area, and the availability of archaeological and tribal monitors for project monitoring if needed, we anticipate no impacts to cultural or historical resources from the Seagrass Recovery Project.

The National Historic Preservation Act of 1966 (NHPA) charges the federal government with protecting the cultural heritage and resources of the nation. A complete review of this project under Section 106 of the NHPA has begun and would be completed as environmental assessment continues. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. All required consultations will be completed prior to any project activity being implemented that could adversely impact any historical properties located within the project area.

12.2.6.5.2 Aesthetics and Visual Resources

Affected Resources

The land use immediately adjacent to the proposed project site is the Naval Live Oaks forest. The general visual character of the Naval Live Oaks unit and the waters off its shore can be described as undeveloped live oak forest and estuarine habitat separated from the Gulf of Mexico by Santa Rosa Island.

Environmental Consequences

No Action

Under the No Action alternative, there would be no impacts to aesthetics and visual resources. No project activities would occur in the area to impact the area's aesthetics or view shed. No mitigation measures would be necessary.

Proposed Action

Temporary impacts to visual resources would result from implementation of the proposed restoration activity. Boats and equipment would be temporarily visible to visitors and recreational users at the project access points (i.e., boat ramps and launch areas). These project-implementation-related impacts to visual resources would be minor, and equipment would only be visible to visitors arriving at the boat ramp areas to launch. Because the seagrass restoration would consist of the manual placement of shoal grass transplant plugs and bird stakes from boats in the large expanse of open-water estuarine areas, no impacts to visual resources would be anticipated. Seagrass restoration would be anticipated to result in a long-term, minor visual enhancement to the Seashore, as the project is intended to mimic the natural process associated with estuarine systems. Therefore, the proposed project impacts would be minor and would not be expected to adversely affect current aesthetics or visual resources.

12.2.6.5.3 Summary of Impacts to Human Uses and Socioeconomics

Impacts to human uses and socioeconomics from the implementation of the Seagrass Recovery Project would be as follows:

- Cultural Resources: There are no anticipated impacts to cultural resources from this project.
- Aesthetics and Visual Resources: There could be very short-term, negligible impacts to aesthetics and visual resources during project implementation. There would be long-term beneficial impacts resulting from the visual appeal of more robust seagrass growth.

12.2.7 Cumulative Impacts

As discussed in Chapter 4, the CEQ NEPA regulations require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined as "the impact on the 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" (40 C.F.R. §1508.7).

The Seagrass Recovery at GUIS's cumulative impacts analysis tiers from the Final Phase III ERP/PEIS cumulative impact analysis of Alternative 4 (Contribute to Restoring Habitats, Living Coastal and Marine Resources, and Recreational Opportunities), found in Section 6.8 of that document, which evaluated the type of restoration activity proposed for this Seagrass Recovery Project. The Final Phase III ERP/PEIS identified nine major action categories, as well as examples of past, present, and reasonably foreseeable future actions in the study area (see Sections 6.8.2 and 6.8.3). The categories of potentially relevant past, present, and reasonably foreseeable future actions included: Restoration related to the *Deepwater Horizon* spill, other relevant environmental stewardship and restoration activities, military operations, marine transportation, energy activities, marine mineral mining (including sand and gravel mining), coastal development and land use, fisheries and aquaculture, and tourism and recreation.

The Final Phase III ERP/PEIS analysis of cumulative impacts relevant to the proposed Seagrass Recovery at GUIS are incorporated by reference into the following cumulative impacts analysis, which focuses on the potential additive effects of the proposed Seagrass Recovery at GUIS, Florida District to the effects of past actions evaluated in the Final Phase III ERP/PEIS cumulative impacts analysis and the effects of some past, present, and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS (see below). The contribution that the proposed project makes to the cumulative impacts is then stated.

12.2.7.1 Site Specific Review and Analysis of Cumulative Impacts to Relevant Resources

This section describes past, present, and reasonably foreseeable future actions that were not discussed in the Final Phase III ERP/PEIS, but which are relevant to identifying any cumulative impacts the proposed Seagrass Recovery at GUIS Project may have on a local scale. Context and intensity, defined in Section 6.2.4 of the Final Phase III ERP/PEIS, are used to determine whether a potential significant cumulative impact from the Seagrass Recovery Project exists.

For the Seagrass Recovery Project at GUIS, specifically, the relevant affected resources analyzed in this EA are:

- Geology and Substrates
- Hydrology and Water Quality
- Air Quality and Greenhouse Gas Emissions
- Living Coastal and Marine Resources (including vegetation, wildlife habitat, marine and estuarine fauna, and protected species)
- Cultural Resources
- Aesthetics and Visual Resources

Local and site-specific past, present and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS were identified through conversations with Park staff and searching websites relevant to GUIS. The local area is defined as the southern portion of the Naval Live Oaks unit and its immediate surroundings. Actions that would be relevant to this Seagrass Recovery Project's cumulative impacts analysis are defined here as those with similar scope, timing, impacts, or location. Websites searched include:

- http://www.nfwf.org/whoweare/mediacenter/pr/Pages/gulf-main-pr-14-1117.aspx
- http://eli-ocean.org/gulf/restoration-projects-database/

This search provided no additional information on actions that are relevant to the Seagrass Recovery Project at GUIS.

Two projects from the Phase III ERP are or could be sited within the immediate vicinity of this Seagrass Recovery Project, and are considered along with the Seagrass Recovery Project in the following cumulative impacts analysis:

1. Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle Project (for an in depth project description and analysis see Final Phase III ERP/PEIS Sections 12.22 and 12.23) would involve enhancing local scallop populations in targeted areas in the Florida Panhandle. The proposed improvements include the harvesting and redistribution of naturally-occurring juvenile scallops supplemented with stocking from a commercial scallop hatchery.

2. Bob Sikes Pier, Parking and Trail Restoration Project (for an in-depth project description and analysis see Final Phase III ERP/PEIS Sections 12.16 and 12.17)would improve access to a fishing pier in the Pensacola area in Escambia County as well as enhancing the quality of the experience for its recreational users. The proposed improvements include renovating parking areas, enhancing bicycle/pedestrian access, and aesthetic improvements to the surrounding area.

Cumulative impacts from these two actions are determined below for each resource and for each of the two Alternatives. The analysis follows the same structure as the Affected Environment and Environmental Consequences section. Also as in the Environmental Consequences section above,

spatial and temporal boundaries were established to identify the past, present, and reasonably foreseeable future actions whose resources overlapped in space and time with those in the Seagrass Recovery Project area. These actions are listed for each resource impact topic below. The type of impact (adverse or beneficial), level of intensity (minor, moderate, or major), and duration (short- or long-term) are stated after each action. Then, 1) the cumulative impacts of the listed actions are assessed and 2) added to the impacts (if any) of the Seagrass Recovery Project, and 3) a cumulative impact is stated for the additive impact of both the listed projects and Seagrass Recovery Project together. Finally, an approximation of the increment added to the cumulative impact by the Seagrass Recovery Project is stated.

The impact thresholds used below tier from the Final Phase III ERP/PEIS, specifically Table 6.2 of Chapter 6 (see Appendix D of this document). Each of the summary statements below about the cumulative impacts to a resource under a given Alternative is based on an assessment made using those definitions.

As noted above, some resource impact topics did not require further consideration because the Seagrass Recovery Project at GUIS would not impact them. Those impact topics are not considered in the cumulative impacts analysis below. Those topics removed from further consideration are:

- Noise
- Socioeconomics and Environmental Justice
- Infrastructure
- Land and Marine Management
- Tourism and Recreational Use
- Marine Transportation
- Public Health and Safety

12.2.7.1.1 Physical Environment

Geology and Substrates

Impacts of the Proposed Action

This analysis tiers from the Final Phase III ERP/PEIS, Section 6.8.4.1.1 Geology and Substrates, Table 6-4. As discussed in that document, actions to restore habitats and living coastal and marine resources vary from seagrass restoration to creation of wetlands and restoration of barrier islands. The effects of restoring habitats and living coastal and marine resources would vary depending on geographic location, proximity of restoration projects to one another, and spatial scale. Generally, these actions are expected to result in minor to moderate short-term construction-related adverse impacts to geology and substrates, primarily related to equipment staging and use, and rutting.

The placement of new structures such as piers, dune walkovers, or viewing platforms could result in minor to moderate long-term adverse effects by changing the natural processes of sediment accretion and erosion, preventing washover events, and causing erosion in offsite locations. Removal of borrow materials would cause long-term minor impacts to localized areas. Construction activities could also

cause long-term soil compaction. However, long-term benefits to geology and substrates are also expected related to sediment deposition on beaches and creation of artificial reefs. In addition to these adverse effects, countervailing impacts associated with reduced erosion or increasing sediment availability from restoration, conservation and recovery efforts associated with other environmental stewardship and restoration activities in the Gulf of Mexico would occur. Additional benefits could accrue where projects improve existing outdated or degraded infrastructure that cause erosion. Alternative 4 was not expected to contribute substantially to cumulative adverse impacts. The Seagrass Recovery Project at GUIS would be anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impact.

In addition to the Final Phase III ERP/PEIS cumulative impacts analysis, the past, present, and reasonably foreseeable future actions from the Final Phase III ERP/PEIS that are in the project area and could impact the geology and substrates of the area as follows:

1. Scallop Enhancement - Bay scallop enhancement would have no effect on geology or substrates in the proposed project areas because there would be no construction activities that would disturb geology or substrate. Bay scallops would be placed in areas where existing habitat conditions, including naturally occurring geologic features and substrate, are appropriate for bay scallops.

2. Bob Sikes Pier would have a relatively small area and amount of soils impacted, and the nature of construction activities, alterations to soil through fill, compaction, grading, and earth moving activities would result in long and short-term, minor adverse impacts to affected soils. However, given that there would be no substantial change in uses at the project area following implementation of the proposed rehabilitation activities, it is anticipated that there would be no long-term negative impacts to soils as a result of site use.

The impact of the Seagrass Recovery Project at GUIS to geology and substrates is expected to be short-term and minor, resulting from disturbance during placement of shoal grass plugs and installation of the bird stakes. However, tidal circulation within the water column is expected to dilute suspended sediments generated from installation. In addition, there would be overall long-term benefit of reestablishing seagrass habitat in the damaged sites from improved sediment stabilization once seagrass is established in the restoration areas.

The past, present, and reasonably foreseeable future actions (including 1 and 2 immediately above, as well as those analyzed in the Final Phase III ERP/PEIS and discussed briefly above) would result, on balance, in both short and long-term, minor adverse and long-term minor benefits to the cumulative impacts to geology and substrates of the area. When combined with the short-term, minor adverse impacts of the Seagrass Recovery Project, as well as the project's long-term benefit of reestablishing seagrass and improving sediment stabilization, on balance, the result is short and long-term, minor, adverse impacts with some long-term beneficial cumulative impacts. The Seagrass Recovery Project at GUIS, Florida District, would contribute a very short-term, minor, adverse increment, as well as a minor long-term beneficial increment, to this cumulative impact.

Impacts of the No Action Alternative

Under the No Action alternative, the past, present, and reasonably foreseeable future actions discussed above would still occur. These actions would result, on balance, in in both short and long-term, minor adverse and long-term minor benefits to the geology and substrates of the area. The Seagrass Recovery at GUIS would not occur under the No Action Alternative. The substrates in damaged seagrass beds would continue to be compromised. When left untreated, propeller scars and blowholes have a tendency to expand in size. Therefore, not completing the Seagrass Recovery Project would contribute a long-term, minor adverse impact to the geology and substrates of the area. When combined with the short and long-term, minor adverse and long-term minor benefits from the other projects in the action area, the balance would be short and long-term minor, adverse impacts and long-term minor benefits to the geology and substrates of the area. However, the Seagrass Recovery would contribute an incremental amount to the long-term, minor, adverse impacts to geology and substrates. The Seagrass Recovery Project would not contribute an incremental amount to the long-term beneficial impacts.

Hydrology and Water Quality

Impacts of the Proposed Action

This analysis tiers from the Final Phase III ERP/PEIS 6.8.4.1.2, Hydrology and Water Quality, Table 6-5. As discussed in that document, actions to restore habitats and living coastal and marine resources vary widely from seagrass restoration to creation of wetlands and restoration of barrier islands. Generally, these actions are expected to result in short-term construction-related adverse impacts, primarily increases in turbidity. However, long-term benefits to hydrology and water quality are also expected, including reduction in the inland flow of salt water, reduction in nutrient and sediment runoff, and reduction in erosion. Alternative 4 was not expected to contribute substantially to cumulative adverse impacts. The Seagrass Recovery Project at GUIS would be anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impact.

Other ongoing and future activities described above under the No Action Alternative in the Final Phase III ERP/PEIS would be expected to continue. As described above, these impacts would include disruption of sediments, increased turbidity, and increased releases of contaminants. Countervailing impacts associated with water quality improvement from restoration, conservation and recovery efforts associated with other environmental stewardship and restoration activities in the Gulf of Mexico would occur. These efforts include those being conducted under Phase I and Phase II Early Restoration.

In addition to the Final Phase III ERP/PEIS cumulative impacts analysis, the past, present, and reasonably foreseeable future actions from the Final Phase III ERP/PEIS that are in the project area and could impact the hydrology and water quality as follows:

1. Scallop Enhancement - Although unlikely, water quality could potentially be impacted during placement of the scallops from equipment leaks or spills or disturbance of sediments that result in siltation, turbidity, and the release of chemicals from sediments. With required mitigation in place, the effect on hydrology and water quality would be measurable or detectable but small, short term,

and localized. Water quality impacts would quickly become undetectable, and the area's hydrology would be only temporarily altered during construction. This project would not impact groundwater, wetlands, or floodplains.

2. Bob Sikes Pier - based on construction activities on land it is possible that some impacts via turbidity and the potential for increased sediment released into water could occur. It is anticipated that all impacts would be short-term in nature occurring only during construction resulting in short-term, minor, adverse impacts to water quality. Long-term, the planned improvements to the parking area, including re-paving and planting native vegetation in appropriate areas, would have a minor beneficial impact on water quality.

The impacts of the Seagrass Recovery Project at GUIS to hydrology and water quality are expected to be short-term, minor, and adverse. Negligible local disturbance could result from placement of bird stakes and minor, short-term impacts could occur from turbidity caused by shoal grass plug harvest and placement and nutrient deposition from bird feces. There would also be long-term beneficial effects from increased seagrasses via diffusion of storm energy, shoreline stabilization, and sediment trapping.

The past, present, and reasonably foreseeable future actions (including 1 and 2 above, as well as those analyzed in the Final Phase III ERP/PEIS) would result, on balance, in short-term, minor, adverse cumulative impacts, as well as long-term beneficial impacts, to the hydrology and water quality of the area. When combined with the short-term, minor, and adverse impact of the Seagrass Recovery Project, as well as the project's long-term benefit of sediment trapping, on balance, the result is short-term, minor, adverse impacts with some long-term beneficial cumulative impacts. The Seagrass Recovery Project at GUIS would contribute a minor, adverse increment as well as a long-term beneficial increment to this cumulative impact.

Air Quality and Greenhouse Gas Emissions

Impacts of the Proposed Action

This analysis tiers from the Final Phase III ERP/PEIS 6.8.4.1.3, Hydrology and Water Quality, Table 6-6. As discussed in that document, actions to restore habitats and living coastal and marine resources vary widely from seagrass restoration to creation of wetlands and restoration of barrier islands. Construction activities associated with natural resource restoration would contribute to impacts to air quality and greenhouse gas emissions in the short-term. However, some level of countervailing beneficial impacts associated with restoration, conservation and recovery efforts from other environmental stewardship and restoration activities in the Gulf of Mexico that increase the ability of the region's natural resources to absorb emissions would occur. Alternative 4 was not expected to contribute substantially to cumulative adverse impacts. The Seagrass Recovery Project at GUIS would be anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impact.

When analyzed in combination with other past, present, and reasonably foreseeable future actions, the habitat restoration project types in the Final Phase III ERP/PEIS would not contribute substantially to short-term or long-term cumulative adverse impacts to air quality or greenhouse gas emissions. To the

extent that they increase CO^2 absorption, habitat restoration projects carried out in conjunction with other environmental stewardship and restoration efforts may result in some long-term beneficial cumulative impacts to greenhouse gas emissions because of the potential for synergistic effects of those project types with these other environmental stewardship and restoration activities.

In addition to the Final Phase III ERP/PEIS cumulative impacts analysis, the past, present, and reasonably foreseeable future actions from the Final Phase III ERP/PEIS that could impact the air quality and greenhouse gas emissions in the project area are as follows:

1. Scallop Enhancement - Project implementation would require the use of outboard motors and tow vehicles, which would lead to temporary air pollution (e.g., criteria pollutants, HAPs, GHGs) due to emissions. Any air quality impacts that occur would be short-term and minor due to their localized nature, short-term duration, and the small size of the project.

2. Bob Sikes Pier - Any air quality impacts that would occur would be localized, short in duration and minimal. Based on the fact that the majority of construction would consist primarily of renovations to existing structures, overall impacts to air quality would be short-term and minor. The implementation of solar-powered lighting along the pier as opposed to fossil fuel powered lights would result in a minor beneficial impact on air quality and GHG emissions through the reduction in the amount of fossil fuel used. Long-term, the site may experience some increase in use by the public but the renovations are expected to improve efficiency. Changes in air quality and GHG are expected to be minor in the long-term.

The impact of the Seagrass Recovery Project at GUIS to air quality and greenhouse gases is expected to be very minor, short term, and adverse. The use of gasoline or diesel-powered vehicles to access the project site(s) would contribute to a very short-term, minor impact from the temporary increase in GHG emissions.

The past, present, and reasonably foreseeable future actions (including 1 and 2 immediately above, as well as those analyzed in the Final Phase III ERP/PEIS) would result, on balance, in short and long-term, minor, adverse cumulative impacts to air quality from greenhouse gas emissions in the project area. When combined with the short-term, minor adverse impact of the Seagrass Recovery Project, on balance, the result is short and long-term, minor, adverse impacts to the air quality of the area. The Seagrass Recovery Project at GUIS would contribute a minor, adverse increment to this cumulative impact.

12.2.7.1.2 Biological Impacts

Living Coastal and Marine Resources (including habitat, vegetation, wildlife habitat, marine and estuarine fauna, and protected species)

Impacts of the Proposed Action

This analysis tiers from the Final Phase III ERP/PEIS 6.8.4.2, Biological Resources, Tables 6-8 and 6-9. As discussed in that document, actions to restore habitats and living coastal and marine resources vary

widely from seagrass restoration to creation of wetlands and restoration of barrier islands. Generally, these actions would result in short-term minor to moderate adverse impacts to habitat and living coastal and marine resources as a result of construction activities. Adverse impacts could include: increased soil erosion, vegetation damage or removal, changes in water quality from turbidity and substrate disturbance from in-water work, and the potential introduction or opportunity for establishment of invasive species. Marine species such as the endangered manatee, protected marine mammals, and listed fish could be affected by noise (construction equipment, drilling, military operations), water quality and substrate disturbances and degradation, vessel operation and habitat loss. Species such as manatees, sea turtles and listed fish have been adversely affected by habitat loss (nesting/spawning/rearing, foraging), reduced prey abundance, overfishing, incidental catch, and increased human presence and activity. Alternative 4 was not expected to contribute substantially to cumulative adverse impacts. The Seagrass Recovery Project at GUIS would be anticipated to fall within the expected range of the Final Phase III ERP/PEIS cumulative impact.

Long-term minor to moderate adverse impacts may also occur from habitat restoration projects where one habitat type is permanently converted to another target habitat type (e.g. displacement of unvegetated open water habitat to restore wetlands or oyster reef). However, since many of these project types focus on restoring or protecting natural resources, Gulf Coast habitats would largely experience long-term beneficial impacts through improved health, stability and resiliency of habitats, including sensitive habitats such as wetlands, barrier islands, areas of SAV, and reefs. These project types could help reestablish native plant communities, stabilize substrates and support sediment deposition, strengthen shorelines, reduce erosion, increase species populations, and decrease species stressors.

Past, present and reasonably foreseeable future actions described above under the Final Phase III ERP/PEIS No Action alternative would be expected to continue. As described in the Final Phase III ERP/PEIS, activities including energy and mining, coastal development and land use, military activities, and marine transportation would result in short- and long-term adverse impacts to habitats including habitat degradation through reduced quality (e.g., reduced water quality or introduction of invasive species), habitat fragmentation, and habitat loss. Construction activities from habitat restoration, conservation and recovery efforts associated with other environmental stewardship and restoration activities would also contribute short term adverse impacts, including the potential for some species to relocate (such as migratory birds). However, countervailing beneficial impacts from habitat restoration, conservation and recovery efforts associated with other environmental stewardship and restoration activities in the Gulf of Mexico would also occur. These actions would likely create new or restore degraded habitats, protect habitats from fragmentation, and preserve unaffected quality habitats, especially sensitive habitats.

In addition to the Final Phase III ERP/PEIS cumulative impacts analysis, the past, present, and reasonably foreseeable future actions from the Final Phase III ERP/PEIS that are in the project area and could impact the habitats and living coastal and marine resources are as follows:

1. Scallop Enhancement - Project installation activities would use BMPs, including impact avoidance of existing seagrass habitat through the use of small vessels for placement of scallops. Every effort would be made to access the scallop placement sites during periods of high tide using shallow draft vessels to minimize potential adverse impacts to seagrass habitat as a result of navigation. Therefore, impacts to seagrass would be short term and minor. The project would result in minor short-term impacts to vegetation. Impacts may be detectable, but would not alter natural conditions and would be limited to localized areas. The proposed project would result in long-term benefits to marine and estuarine fauna by providing additional fish habitat, increased benthic productivity, and enhanced recruitment and production of fish and crustaceans. Disturbance to any EFH and species using the Seagrass habitat in areas adjacent to locations where scars would be restored would be minor and short in duration, with risks further mitigated by following identified best management practices during construction.

2. Bob Sikes Pier – The Trustees determined the project would have no effect to listed, proposed, or candidate species and would not result in adverse modification or destruction of proposed or designated critical habitat under the jurisdiction of the USFWS or the NMFS, including EFH.

The Seagrass Recovery Project at GUIS may have short-term minor adverse impacts to animals and their habitats because of temporary damage to seagrass surrounding the propeller scars as a result of watercraft access to the restoration sites, harvest and placement of seagrass plugs from nearby beds, and inadvertent damage during restoration. The long-term benefits of the seagrass recovery effort would outweigh potential temporary adverse impacts, and include restoration of this community type, water quality enhancement, and increased habitat for commercial and recreational fisheries.

The past, present, and reasonably foreseeable future actions (including 1 and 2 immediately above, as well as those analyzed in the Final Phase III ERP/PEIS) would result in temporary, short and long-term, minor adverse impacts during project implementation, as well as long-term benefits to habitats and living and coastal marine resources after project completion. When combined with the temporary minor adverse impacts, and the long-term beneficial impacts of the Seagrass Recovery Project on improving habitat, on balance, the result is short and long-term, minor adverse impacts with some long-term beneficial cumulative impacts. The Seagrass Recovery Project at GUIS would contribute both a minor, short-term, adverse impact, as well as a long-term beneficial increment to this cumulative impact.

12.2.7.1.3 Human Uses and Socioeconomics

Cultural Resources

Impacts of the Proposed Action

This analysis tiers from the Final Phase III ERP/PEIS 6.8.4.3.2, Socioeconomics and Environmental Justice, Table 6-11. As discussed in that document, actions to restore habitats and living coastal and marine resources vary widely from seagrass restoration to creation of wetlands and restoration of barrier islands. The effects of these project types would vary depending on geographic location.

Past, present, and reasonably foreseeable future activities described under the Final Phase III ERP/PEIS No Action Alternative would be expected to continue. As described above, these impacts would include impacts on known as well as not-yet-documented cultural resources, and would vary by activity and location. In addition to adverse effects, countervailing impacts to cultural resources from restoration, conservation and recovery efforts associated with other environmental stewardship and restoration activities in the Gulf of Mexico could occur. These beneficial impacts could include the identification and subsequent protection of cultural resources that may otherwise have been unknown or unprotected.

When analyzed in combination with other past, present, and reasonably foreseeable future actions, the preferred alternative of the Final Phase III ERP/PEIS (Alternative 4) is not expected to contribute substantially to short-term or long-term adverse or beneficial cumulative impacts to cultural resources.

In addition to the Final Phase III ERP/PEIS cumulative impacts analysis, two past, present, and reasonably foreseeable future actions from the Final Phase III ERP/PEIS are in the project area, however there are currently no known impacts to cultural resources from these two projects:

1. Scallop Enhancement - No known impacts identified in the Final Phase III ERP/PEIS

2. Bob Sikes Pier – No known impacts identified in the Final Phase III ERP/PEIS

The Seagrass Recovery Project at GUIS is not anticipated to have any impacts on cultural resources. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

The past, present, and reasonably foreseeable future actions (including 1 and 2 immediately above, as well as those analyzed in the Final Phase III ERP/PEIS) are not anticipated to have any impacts on cultural resources in the project area.

12.2.8 Summary and Next Steps

The proposed Seagrass Recovery Project would include surveying and mapping scarring within the seagrass habitats in the Naval Live Oaks unit of the Seashore. Additionally, shoal grass plugs would then be harvested and transplanted in 0.02 acres of seagrass bed areas in need of re-vegetation. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would provide long-term benefits by restoring approximately 0.02 acres of seagrass habitat. Coordination and informal consultation under the ESA, MMPA, MSFCMA, MBTA, and BGEPA have been completed. The USFWS concurred that no threatened, endangered, or candidate species or critical habitat or other protected species would be adversely affected as a result of implementing this proposed project. The Trustees have initiated consultation on the ESA (NOAA jurisdiction) and MSFCMA; the consultations for both ESA and MSFCMA are complete. For ESA compliance, NOAA

determined that this project selected for implementation in Phase IV of the DWH Early Restoration Plan will have No Effect to listed species under the jurisdiction of National Marine Fisheries Service. For MSFCMA compliance, NOAA concurs that project implementation would result in minimal temporary EFH impacts to restore propeller scars within SAV habitat. Best management practices to minimize both short term construction impacts and long term impacts to sensitive habitats have been developed. The Trustees have completed coordination and reviews under the Marine Mammal Protection Act and determined that this project does not require authorization under the MMPA. The Trustees have initiated coordination and reviews under the National Historic Preservation Act and are coordinating on other federal statutes. Pursuant to the Coastal Zone Management Act of 1972, federal actions must be consistent with the federally approved coastal management programs for states where the activities would affect a coastal use or resource of the state. The Federal Trustees' consistency determination for this project was submitted to the FDEP on May 21, 2015. The FDEP responded by letter dated July 10, 2015 advising that, based on the information contained in the Draft Phase IV ERP/EA and the coordinated state agency staff review, the state had determined that, at this stage, the proposed activities are consistent with the FCMP. As noted in that response, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in Florida, as may be applicable." The Trustees will consider public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts.

The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. Public comments and Trustee responses are found in Chapter 15.

12.3 References

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Chapter 13: Sea Turtle Early Restoration Project

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13.1 Sea Turtle Early Restoration Project: Project Description

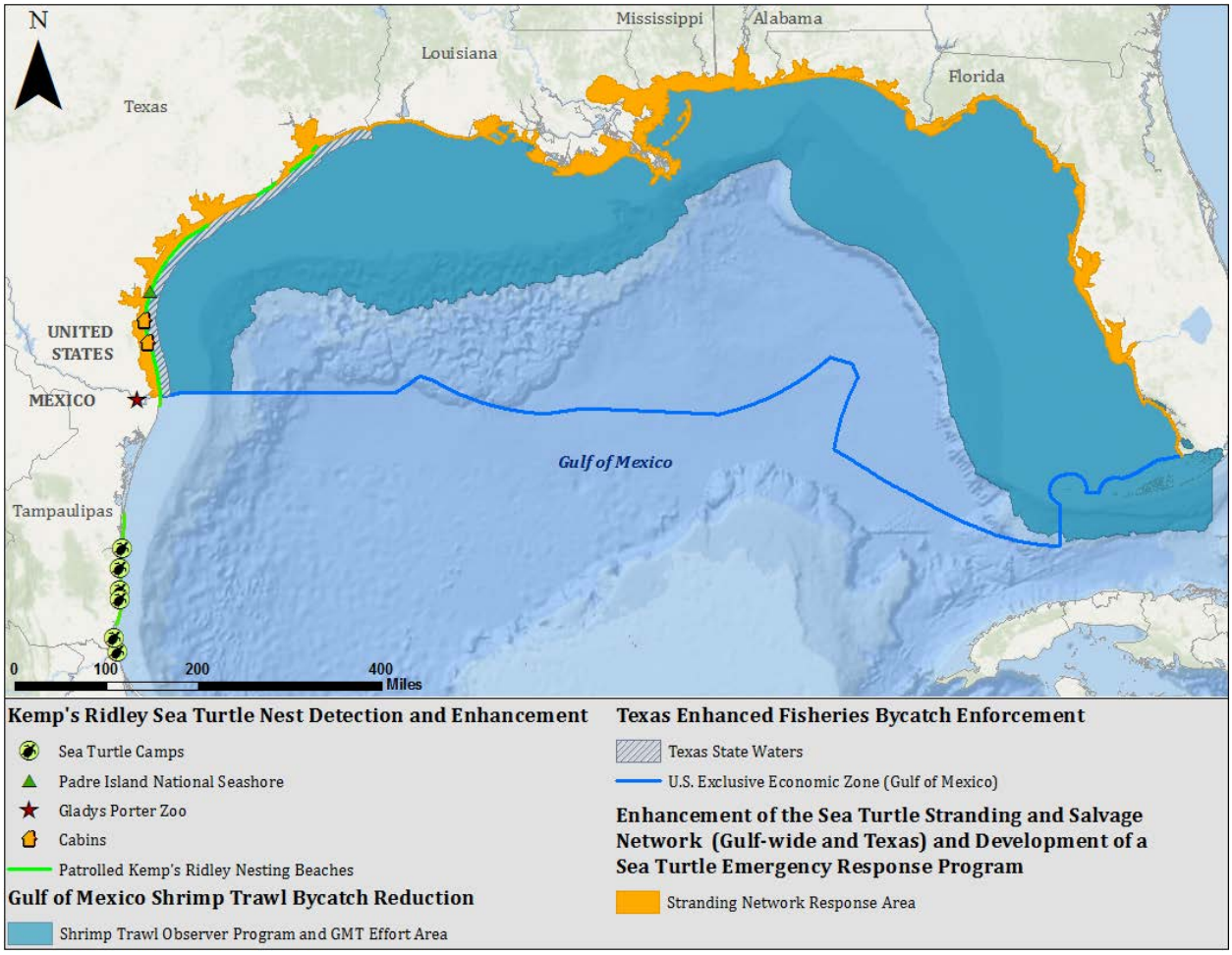
This chapter provides an introduction and project summary for the Sea Turtle Early Restoration project; a general description of each of the project's four components with relevant background information; a discussion of the sea turtle project's consistency with project evaluation criteria; a description of planned performance criteria, monitoring and maintenance for all project components; a description of the type and quantity of Offsets BP will receive for funding the sea turtle project; the total estimated cost of the sea turtle project; and the environmental assessment for the project.

13.1.1 Introduction

The Sea Turtle Early Restoration project consists of four complementary project components: (1) Kemp's Ridley Sea Turtle Nest Detection and Enhancement; (2) Enhancement of the Sea Turtle Stranding and Salvage Network (STSSN) and Development of an Emergency Response Program; (3) Gulf of Mexico Shrimp Trawl Bycatch Reduction; and (4) Texas Enhanced Fisheries Bycatch Enforcement, which will aid in the recovery of sea turtles. In combination, these components are a multi-faceted approach to sea turtle restoration that addresses threats to sea turtles on their nesting beaches and in the marine environment.

The Kemp's Ridley Sea Turtle Nest Detection and Enhancement project component will provide needed additional staff, training, education activities, equipment, supplies, and vehicles over a 10-year period in both Texas and Mexico for Kemp's ridley sea turtle nest detection and protection. It will also provide for the addition of two cabins and two nesting corrals on the southern end of the Padre Island National Seashore (PAIS). The Enhancement of the STSSN and Development of an Emergency Response Program component will enhance the existing STSSN beyond current capacities for 10 years in Texas and across the Gulf as well as develop a formal Emergency Response Program within the Gulf of Mexico to increase the survival of sea turtles during cold stun and other emergency stranding events. The Gulf of Mexico Shrimp Trawl Bycatch Reduction component will enhance two existing NOAA programs which work to reduce the bycatch of sea turtles in the Gulf of Mexico. The two programs are the Gear Monitoring Team (GMT) and the Southeast Shrimp Trawl Fisheries Observer Program (Observer Program). The existing GMT program will be expanded to include additional staff to provide a greater capacity for education and outreach to the shrimp fishing community to improve compliance with federal Turtle Excluder Device (TED) regulations. The existing Observer Program will be expanded to include an additional 300 observer sea days annually for a 10-year period. The Texas Enhanced Fisheries Bycatch Enforcement component will enhance TPWD enforcement activities for fisheries that incidentally catch sea turtles while they operate primarily in Texas State waters (approximately 367 miles of coast line out to 9 nautical miles) within the Gulf of Mexico for a 10-year period. These increased enforcement operations will focus on compliance with TED regulations during the Gulf of Mexico shrimp fishery season (primarily February through mid-May).

Figure 13-1. Geographic area of the Phase IV Sea Turtle Early Restoration project



13.1.2 Project Summary

The Trustees are proposing a Phase IV Early Restoration project for sea turtles, comprised of the following four components[1]:

1. Kemp's Ridley Sea Turtle Nest Detection and Enhancement;
2. Enhancement of the STSSN and Development of a Sea Turtle Emergency Response Program;
3. Gulf of Mexico Shrimp Trawl Bycatch Reduction; and
4. Texas Enhanced Fisheries Bycatch Enforcement.

[1] The project components may have been titled or referred to differently in prior documents.

Figure 13-1 provides a map of the geographic areas where the sea turtle project components will occur. This project is consistent with the goal of compensating the public for natural resource injuries resulting from the Spill.

Section 13.1 includes a general description of the sea turtle project's consistency with project evaluation criteria; the planned performance criteria, monitoring and maintenance for all project components; the type and quantity of Offsets BP will receive for funding the sea turtle project; and the total estimated cost of the sea turtle project. Only the Background and Project Description subsections are organized by individual project component.

Section 13.2 includes the Environmental Assessment (EA) for the project. The project is analyzed and described as one EA comprised of three sections, based on observed similarities among the four project components that make it possible to analyze the four components in three sections. Each of the three sections includes resource specific discussions on the affected environment and an analysis of the anticipated environmental consequences involved with the project. After the three sections, there is a synopsis that summarizes the overall impacts of the project. The project falls within the Trustees' preferred Programmatic Alternative identified in the Final Phase III ERP/PEIS.

13.1.3 Background and Project Component Descriptions

13.1.3.1 Kemp's Ridley Sea Turtle Nest Detection and Enhancement

The Kemp's Ridley Sea Turtle Nest Detection and Enhancement project component will provide funding to support ongoing conservation efforts for the Kemp's ridley sea turtle. The Bi-National Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) (NMFS and USFWS, and Secretary of Environment and Natural Resources, Mexico [SEMARNAT] 2011) outlines a recovery strategy that includes nest detection and protection. The primary goal of this project component is to reduce sea turtle hatchling mortalities through continued support for nest detection and protection activities in Texas and Mexico as part of the ongoing Kemp's ridley recovery efforts. Funding for this project component will provide needed support for additional staff, training, equipment, supplies and vehicles over a 10-year period in both Texas and Mexico. The project component will also provide for the construction of two cabins and two nesting corrals on the southern end of the PAIS.

The Kemp's ridley is the smallest of the seven species of sea turtles and the only species that nests primarily during the daytime (Figure 13-2); it is also one of the most vulnerable sea turtle species in the world. The Kemp's ridley sea turtle was listed as endangered throughout its range on December 2, 1970 (USFWS 1970), and has received federal protection under the ESA and preceding law since that time. Kemp's ridleys are distributed throughout the Gulf of Mexico and along the U.S. Atlantic coast, from Florida to New England. Most Kemp's ridley turtles nest on the Gulf of Mexico coastal beaches between Playa de Tepehuajes to Barra del Tordo/Playa Dos in the state of Tamaulipas, Mexico. Although the majority of Kemp's ridley nesting occurs in Mexico (USFWS 1970), some nesting also occurs along the Texas Gulf coast. Kemp's ridley sea turtle nests have been recorded on the Texas coast since 1948 (Shaver and Caillouet 1998 and Shaver 2005). In 1978, a collaborative bi-national program between

Mexico and the United States was developed to recover the species and began with a strategy to protect nests and nesters.

Figure 13-2. Kemp's ridley sea turtle nesting at PAIS. Photo credit: National Park Service

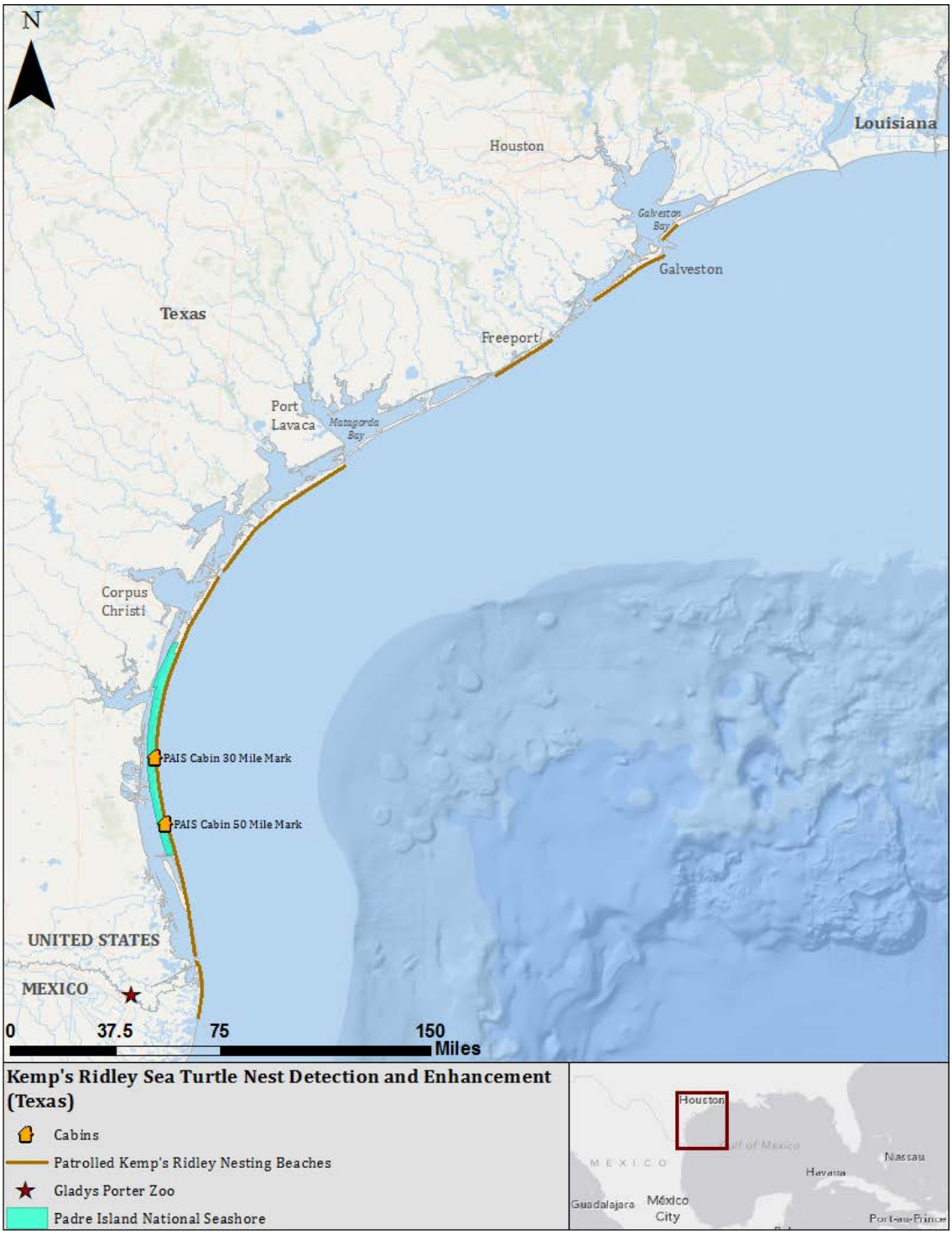


The nest detection efforts in Texas for the Kemp's ridley are coordinated by DOI and include partnerships between federal and state agencies, non-governmental organizations (NGOs), and universities. Additionally, the U.S. supports ongoing nest detection and protection efforts in Mexico through the Gladys Porter Zoo.

13.1.3.1.1 Texas Activities

Efforts to locate, document, study, and protect nesting Kemp's ridley turtles and their nests in Texas began at PAIS in 1986 and continue today, however nesting patrols were not comprehensive until 1998 (Shaver 2005). In cooperation with several partners, the NPS conducts an extensive program to detect, document, and protect nesting Kemp's ridley sea turtles and their nests in Texas. Today, nest detection patrols occur to some extent from the Bolivar Peninsula on the north Texas Gulf Coast to Boca Chica Beach at the Texas/Mexico border. Kemp's ridley nest primarily during the day in Texas and patrols are generally conducted daily from April through mid-July (Figure 13-3).

Figure 13-3. Patrols conducted on the Texas coast



Eggs from Kemp's ridley nests found during patrols from North Padre Island northward on the Texas coast are excavated and brought to the incubation facility at PAIS for protected care. Eggs from some of the nests found at the southern end of the PAIS are placed into a large screened enclosure called a corral. The eggs placed in the corral are monitored and protected from predation until they hatch. Similarly, eggs from nests found on South Padre Island and Boca Chica beaches are placed in a corral on South Padre Island. Hatchlings from protected nests in Texas are then released into the Gulf of Mexico at PAIS and South Padre Island (Figure 13-4).

Figure 13-4. Kemp's ridley hatchling release at South Padre Island, Texas. Photo credit: Texas Parks and Wildlife Department



Nests found along the Texas coast north of PAIS are brought to the incubation and corralling facilities at PAIS to protect them from a variety of human related and natural threats. However, these generally account for less than 20 percent of the total nests detected in Texas each year. The hatchlings are released on the National Seashore in an effort to re-establish a secondary nesting colony on the federally protected lands at PAIS, as part of the overall Kemp's ridley recovery strategy. The few nests that are not found during patrols of the Texas coast incubate naturally in the sands at the nest site (*in situ*). Since these nests are not subject to additional protection, they typically have a lower survival rate than protected nests. Nests from the four other sea turtle species that occur in the Gulf of Mexico have also been documented on Texas shores. Nest patrols in Texas generally do not encompass the entire nesting seasons for these other species. However, if encountered during the nest patrols they are relocated to incubation/corral facilities at PAIS or the corral on South Padre Island.

The detection of nests, relocation of eggs and release of hatchlings is a labor and equipment intensive process conducted in remote and harsh environments of the Texas coast. This portion of the restoration project component will maintain, improve and/or enhance current nest detection, collection and transport of, and protected incubation and care of Kemp's ridley sea turtles eggs and hatchlings in Texas. Project funding will enable activities to be more comprehensive and effective, leading to reduced sea turtle hatchling mortality. The project component, implemented by the Texas Trustees[2] and DOI, will provide funding to NPS, TPWD, USFWS, and other partner NGOs and universities to support ongoing nest detection patrols and protection for the next 10 years. The funding will support personnel expenses, supplies, construction of facilities, equipment, fuel, vehicle purchases and maintenance as part of the current nest detection program.

NPS is responsible for detecting and protecting nesting turtles and their nests on North Padre Island, including PAIS. The patrol route on PAIS is nearly 80 miles of sand beach with no infrastructure for the southernmost 60 miles. The difficult driving conditions and limited communications over these 60 miles require the use of four-wheel drive vehicles and require staff to be self-sufficient in a coastal wilderness area. Rapidly changing weather and tidal conditions can also pose significant safety threats to staff and equipment. The Kemp's ridley sea turtle nest detection and enhancement restoration project component will include funding from DOI for the construction of two base camp cabins in the remote southern end of PAIS. In order to reduce risks associated with transporting eggs long distances over rough terrain, a nesting corral will be constructed near each base camp.

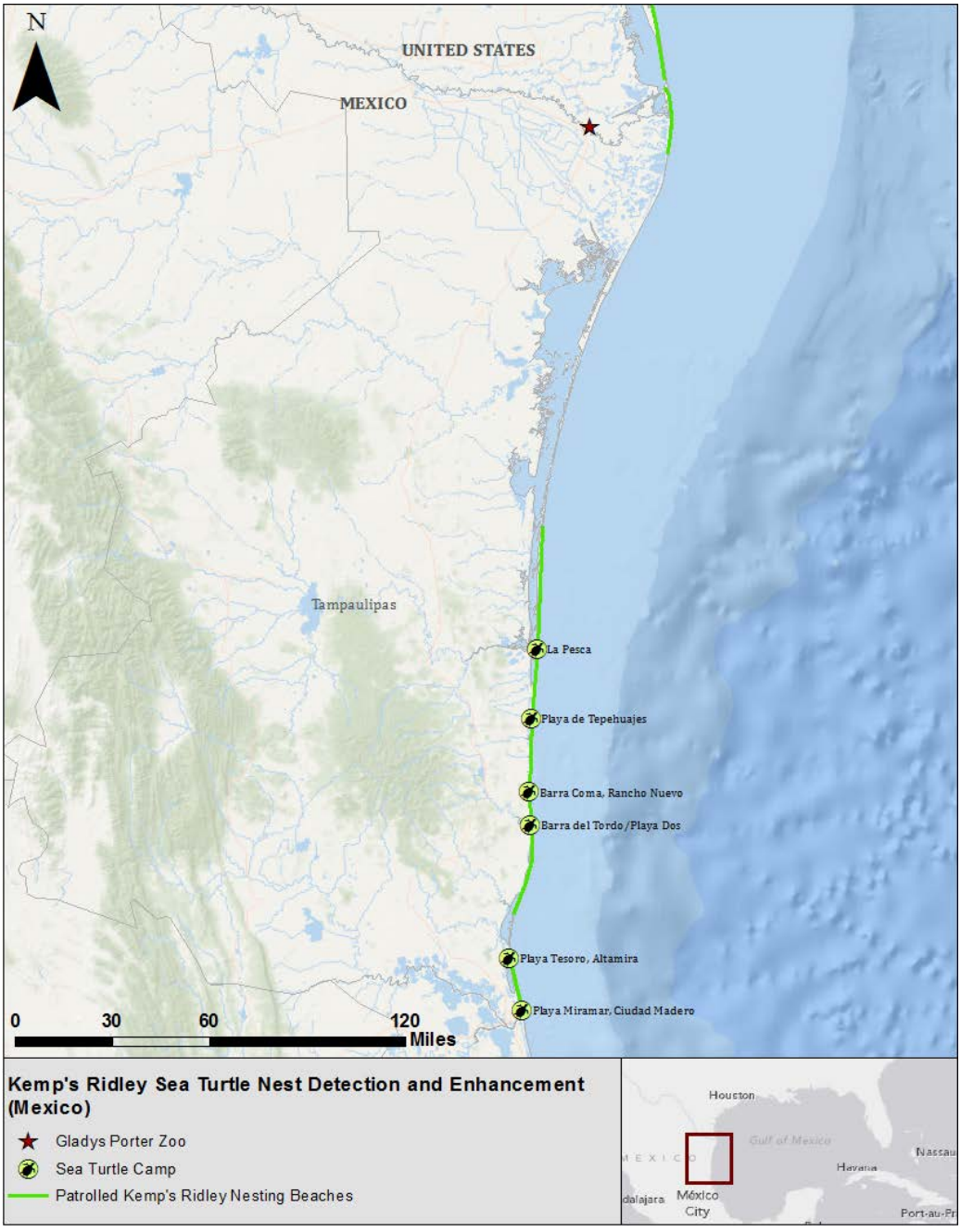
The cabin construction will improve detection and protection efforts on PAIS beaches, thereby decreasing response time, increasing corral capacity and shortening the travel distance from nest to corral, with the goal of thereby increasing hatchling survival. The constructed cabins will replace the original two cabins that were lost in 1999 to Hurricane Bret. Construction of these two cabins will provide better distribution of park staff to begin and end their patrols each day, allowing for more work hours applied towards monitoring. Construction of the cabins will also be used to mitigate or reduce employee safety risks while working in the remote areas of the seashore. During times of inclement weather and emergency situations, the new cabins will allow for additional locations where park staff could find refuge or shelter. This project component will also include sea turtle egg corrals, at each of the cabins. Situating these corrals near the cabins provides overnight observation and safety for the eggs. Having the corral locations centralized relative to the patrol routes (near the National Seashore's 30 and 50-mile marks) will optimize park staff efforts to relocate eggs to one of these corrals shortly after being excavated from their nest. This action will reduce the transport time of eggs lessening the potential for egg embryo injury. Once hatchlings emerge, they will be released near the various corrals which are closer to where the nests were found and will further disperse the hatchlings along Gulf of Mexico beaches.

[2] The Texas Trustees include the Texas Commission on Environmental Quality, Texas General Land Office, and Texas Parks and Wildlife Department (TPWD).

13.1.3.1.2 Mexico Activities

Over 90% of the Kemp's ridley population nests along 78-miles of beach that stretches from Playa de Tepehuajes to Barra del Tordo/Playa Dos in the state of Tamaulipas, Mexico (Figure 13-5, Gladys Porter Zoo 2013). Should any disaster, manmade or natural, befall that reproductive epicenter, recovery of the species could be set back years. Since 1981, the Gladys Porter Zoo has administered the United States' portion of funds for the joint U.S./Mexico effort to protect and increase the production of Kemp's ridley sea turtles at their natal beaches located in the state of Tamaulipas, Mexico.

Figure 13-5. Location of Kemp's ridley sea turtle nesting beaches in Mexico



From 1966 to 1987, conservation efforts focused on the area of Rancho Nuevo with the camp currently located at Barra Coma. In 1978, the U.S. joined with Mexico to undertake nest protection activities at Rancho Nuevo. The bi-national program expanded in 1988 to the south to Barra Del Tordo with a camp at Playa Dos. A third camp was established to the north a year later. This camp has been relocated several times and since 1996 has been located near the beach of Playa de Tepehuajes. In that same year and in coordination with partner agencies in Mexico, three new camps were established, one near the town of La Pesca and two near the cities of Ciudad Madero and Altamira at the beaches of Playa Miramar and Playa Tesoro, respectively.

The nesting season efforts in Mexico generally begin in March with the preparation of the camps and building of protective corrals. Patrols in Mexico begin in earnest in April and continue through the end of August, sometimes continuing into the middle of September. On average, there are three patrols per day from March through August. Counting the patrols, efforts during massive synchronous nesting events (i.e., arribadas), the hatchling releases, and other activities, an estimated 134,000 miles are patrolled during the six-month nesting season, requiring approximately 108,000 person-hours. Current efforts record relevant data and relocate many of the egg clutches to protective corrals. After the incubation period, hatchlings from the protected nests are counted and released into the Gulf of Mexico.

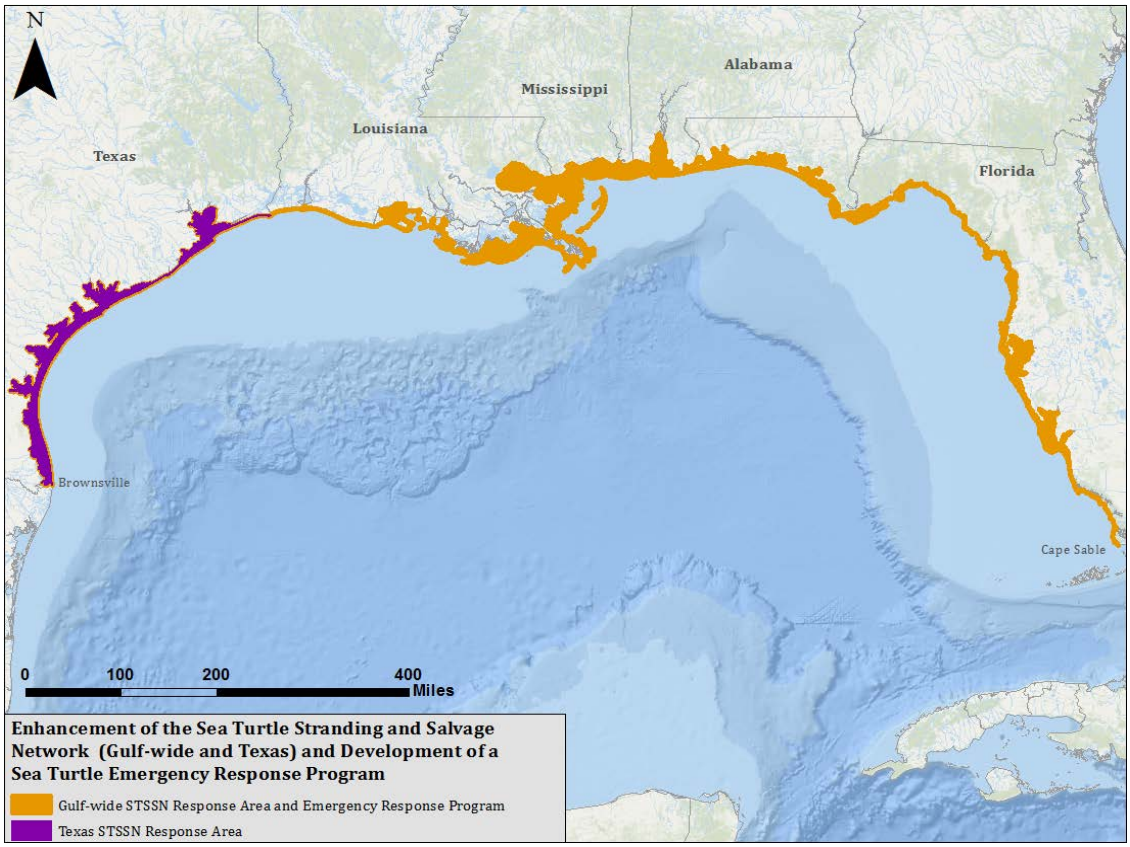
Project funds for the Kemp's Ridley Sea Turtle Nest Detection and Enhancement project component will be used to maintain, improve and/or enhance long-term nest detection, egg relocation, and protection of nests in Mexico. Texas Trustees will provide funding to the Gladys Porter Zoo over a 10-year period to support nesting patrols, nest protection, and local education efforts as well as improve infrastructure at turtle camps. These activities are part of the long-term efforts identified in The Recovery Plan (NMFS and USFWS, and SEMARNAT 2011). For the Mexico activities of this project component, a bi-national field crew, including staff from the Gladys Porter Zoo and Mexico, will work under the supervision of trained sea turtle biologists to conduct beach patrols looking for sea turtles, sea turtle tracks, and their nests.

Relocating eggs into corrals is currently the most efficient and effective way of protecting nests from predation in this region. In the late 1970's and early 1980's at the inception of the bi-national program, low nesting numbers and heavy predation threatened nests left *in situ*. Nesting success was extremely low and led to the use of relocation and corralling techniques. Through these efforts, the number of hatchlings released back into the Gulf can be maximized. The majority of this project component funding is intended to increase the level of *in situ* nest protection and improve hatchling recruitment through increased predation prevention and patrolling efforts. After the incubation period, which, depending on the temperature can be anywhere from 45 to 60 days, hatchlings from the protected nests are counted and released into the Gulf of Mexico.

13.1.3.2 Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program

This project component will include 1) NOAA's enhancement of the Gulf of Mexico STSSN beyond current capacities for 10 years, 2) Texas Trustees' enhancement of the STSSN within Texas beyond current capacities for 10 years, and 3) NOAA's establishment of a formal Sea Turtle Emergency Response Program within the Gulf of Mexico. This project component has the goal of improving response capabilities to recover dead and injured sea turtles. The three elements of this project component are described below and their geographic scope is illustrated in Figure 13-6.

Figure 13-6. Geographic scope of the Sea Turtle Stranding and Salvage Network (Gulf-wide and Texas) and Development of a Sea Turtle Emergency Response Program



13.1.3.2.1 Enhancement of the Sea Turtle Stranding and Salvage Network

The STSSN was formally established in 1980 to collect information on and document strandings of sea turtles along the U.S. Gulf of Mexico and Atlantic coasts. Sea turtle strandings are defined as animals that either wash ashore or are found floating, dead or alive, and if alive, generally in a weakened condition. The STSSN includes federal, state and private partners, and is coordinated by NOAA. Each state has a STSSN coordinator, who coordinates stranding response within their state. The agencies that host the state coordinator for each state are; NPS for the Texas STSSN, Louisiana Department of Wildlife

and Fisheries for the Louisiana STSSN, NOAA for the Mississippi STSSN, USFWS for the Alabama STSSN, and Florida Fish and Wildlife Conservation Commission for the Florida STSSN.

Stranded turtles are documented on a standardized STSSN stranding form. Depending on species, size, location and carcass condition, dead stranded sea turtles are necropsied in the field, buried on the beach, or transported to freezer storage for later necropsy and sample collection. Live stranded turtles are transported to rehabilitation facilities or triaged in Mobile Aquatic Sea Turtle Holding (MASH) units during cold stun events or emergency response incidents.

NOAA's Enhancement of the Gulf-Wide Sea Turtle Stranding and Salvage Network

NOAA will implement enhancements to the infrastructure of the Gulf of Mexico STSSN across all five states to enhance the capability for response, enhanced coordination, data handling and reporting, and streamlined data dissemination for use in conservation management programs. Participants in the Gulf-wide STSSN enhancement will include NOAA and the state STSSN coordinators for each of the five Gulf states. The enhancement will provide STSSN staffing positions across the Gulf-wide STSSN to improve response capabilities to recover dead or injured sea turtles and to handle and disseminate data for improved conservation management. The project will include funding for positions in each of the five states, and three new positions hired by NOAA to focus on Gulf-wide STSSN coordination. The intent of the enhanced STSSN is to provide a more rapid response to unusual stranding events, allowing mortality sources to be identified and addressed more rapidly and solutions to be implemented where possible. For example, if unusual strandings or increased stranding levels are observed in a particular area, and necropsies of those animals indicate forced submergence or fishery interactions to be the likely cause, then that information will be shared with the GMT and federal and state law enforcement agencies (i.e. TPWD Law Enforcement) to better direct where outreach and education and enforcement efforts could be focused.

Enhancement of the Sea Turtle Stranding and Salvage Network and Rehabilitation Efforts in Texas

DOI and the Texas Trustees will provide additional enhancement of the STSSN within Texas by providing funding to STSSN partner NGOs, universities, and rehabilitation providers to expand the capacity of the network. Stranded sea turtles in Texas are generally located during directed searches and as a result of reports from the public. Because much of the Texas coast is remote, difficult to access, and often requires a four-wheel drive vehicle or boat to retrieve stranded turtles, response times to stranded sea turtles can be lengthy. This component will replace lost funding and expand the STSSN's capacity to find and rehabilitate injured and cold stunned turtles, with the goal of increasing the number of live sea turtles being returned to the Gulf, see Figure 13-7. Funding will go towards staffing, equipment, vehicles, and supplies. Participants supporting the enhancement of the STSSN and rehabilitation efforts in Texas include NOAA, DOI, and TPWD as well as various partner NGOs, universities and rehabilitation providers. NPS serves as the Texas state coordinator for the STSSN, with both state-wide and local responsibilities regarding sea turtle strandings on the Texas coast. NPS staff members from PAIS provide

training and technical assistance to STSSN participants in Texas and maintain the records of Texas sea turtle strandings.

Figure 13-7. Green sea turtles on their way to a release site in the Lower Laguna Madre, Texas, after being rescued and rehabilitated due to a cold stun event. Photo Credit: Texas Parks and Wildlife Department



13.1.3.2.2 Development of a Sea Turtle Emergency Response Program

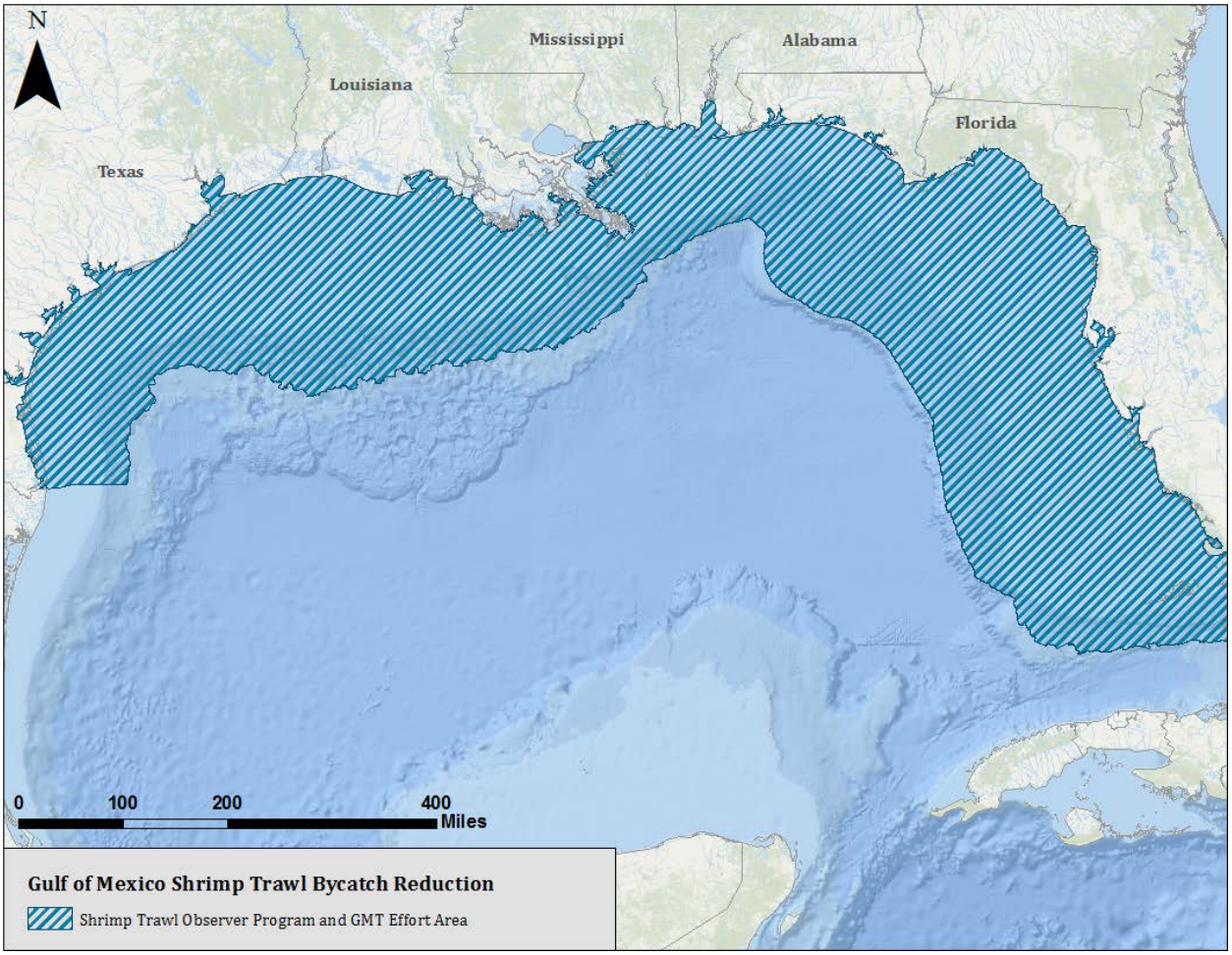
This project component will provide funding for NOAA to develop and implement a comprehensive Sea Turtle Emergency Response Program in the Gulf of Mexico to increase the STSSN's capacity for response during emergency events, with the objective of increasing the survival of sea turtles during emergency events. A significant gap exists in STSSN preparedness for response to emergency events that could potentially kill and/or injure large numbers of sea turtles. This project component will have a primary focus of creating a formal plan and necessary infrastructure (i.e. supplies and equipment) and a robust training program to allow for rapid response to cold stun events that may kill or injure large numbers of

sea turtles. These events require search and rescue operations, triage, treatment, temporary holding, and eventual release of turtles, see Figure 13-7. Secondarily, the program will enhance capacity to respond to other emergency events such as hazardous weather events, oil spills, and harmful algal blooms. The program will work to increase response capacity by decreasing response times and increasing search areas during emergency events. Five MASH units and trailers will be purchased. Each contains twelve 500-gal tanks with filtration, UV filters, tents and setup equipment. This component will also include the use of contracts for vessel support during emergency events.

13.1.3.3 Gulf of Mexico Shrimp Trawl Bycatch Reduction

The Gulf of Mexico Shrimp Trawl Bycatch Reduction project component will be implemented by NOAA and will enhance two existing NOAA programs, the Gear Monitoring Team (GMT) program and the Observer Program, described below (Figure 13-8).

Figure 13-8. Geographic Scope of the Gulf of Mexico Shrimp Trawl Bycatch Reduction project components

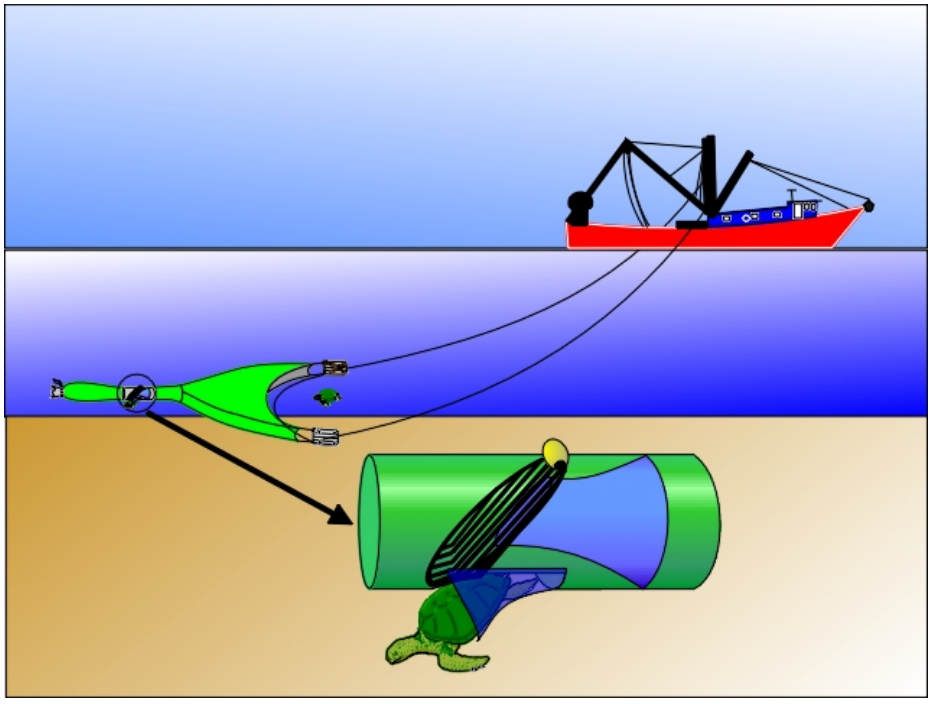


13.1.3.3.1 Gulf of Mexico Gear Monitoring Team Enhancement

This project component will expand NOAA's GMT program within the Gulf of Mexico. The primary goal of the expanded GMT program is to increase capacity for education and outreach to the shrimp fishing community to improve compliance with existing federal TED regulations. The expanded GMT is intended to provide direct benefits to sea turtles by decreasing the likelihood of capture mortality through greater use of properly built, installed, and maintained TEDs.

A TED is a grid that fits into the cod end of the trawl, with a top or bottom escape opening covered with a flap (Figure 13-9). Sea turtles, and other animals such as sharks, encounter the TED grid when they pass through the trawl and are able to escape through the adjacent opening. Small animals, such as shrimp, pass through the bars of the TED and are caught in the cod end of the trawl. When installed properly, TEDs are expected to be 97% effective at releasing sea turtles from trawl gear.

Figure 13-9. Drawing depicting the placement of a TED in a trawl net. Credit NOAA-NMFS, Southeast Fisheries Science Center



NOAA's GMT program operates out of the Southeast Fisheries Science Center, Pascagoula Lab, and currently consists of one mobile team comprised of two individuals. This project component will add two new teams (each consisting of 2 staff), increasing the program to three teams total. The two new teams will be deployed throughout the Gulf of Mexico. The GMT will improve TED compliance by working closely with TED manufacturers and net shops to assist and ensure that TEDs are properly built and installed to the required standards. The GMT will work with the fishing industry to improve their

knowledge and understanding of how to effectively build, use, and maintain TEDs. This will be achieved through offering workshops and courtesy dock-side and at-sea TED inspections.

The GMT will also work closely with the Observer Program and the STSSN to identify specific areas of bycatch concern within the Gulf. Through working with state agencies, the Observer Program, and the STSSN, the GMT will target under-represented areas in the Gulf and areas identified as potentially problematic for sea turtle bycatch. The project component is designed to enhance coordination with other State and Federal agencies, fishing industry and fishery associations (State and National). The actions will provide additional support and resources that are needed to increase compliance with TED regulations.

13.1.3.3.2 Southeast Shrimp Trawl Fisheries Observer Program Enhancement

This project component will expand the capacity of NOAA's Observer Program to place trained observers on shrimping vessels in the Gulf of Mexico to monitor sea turtle bycatch. The Observer Program is operated out of the NOAA National Marine Fisheries Service (NMFS), Southeast Fisheries Science Center, Galveston Lab. The primary goal of the expanded Observer Program will be to improve capacity to collect data on bycatch of sea turtles in the shrimp trawl fishery in the Gulf. The funding for this project component will add 300 observer sea days annually for a 10-year period. This additional coverage will focus on specific times and areas identified as priorities for monitoring sea turtle bycatch to allow for better characterization and assessment of bycatch. Information on sea turtle interactions with fishing activities will help target, refine, and improve conservation management and potential recovery of sea turtles in the Gulf.

NOAA's Observer Program currently observes approximately 2% of the commercial shrimp trawl fleet in the Gulf of Mexico and Southeast U.S. Atlantic (approximately 1,500 sea days annually), at an annual cost of approximately $2 million (NMFS 2013, NMFS 2012). The additional information gained through this expansion will also be used to better inform the target areas for GMT efforts and the STSSN to improve conservation management and recovery of sea turtles in the Gulf of Mexico. The intent of the expansion of the Observer Program monitoring is to ultimately decrease the number of bycatch mortalities of Kemp's ridley, loggerhead, and green sea turtles in the shrimp trawl fishery in the Gulf of Mexico. The placement of observers will be reviewed by NOAA to ensure that observations are occurring at the correct times and/or locations where sea turtles are likely to be present and where bycatch concerns are greatest.

Figure 13-10. Loggerhead sea turtle escaping from a TED. Photo credit: Credit NOAA-NMFS, Southeast Fisheries Science Center

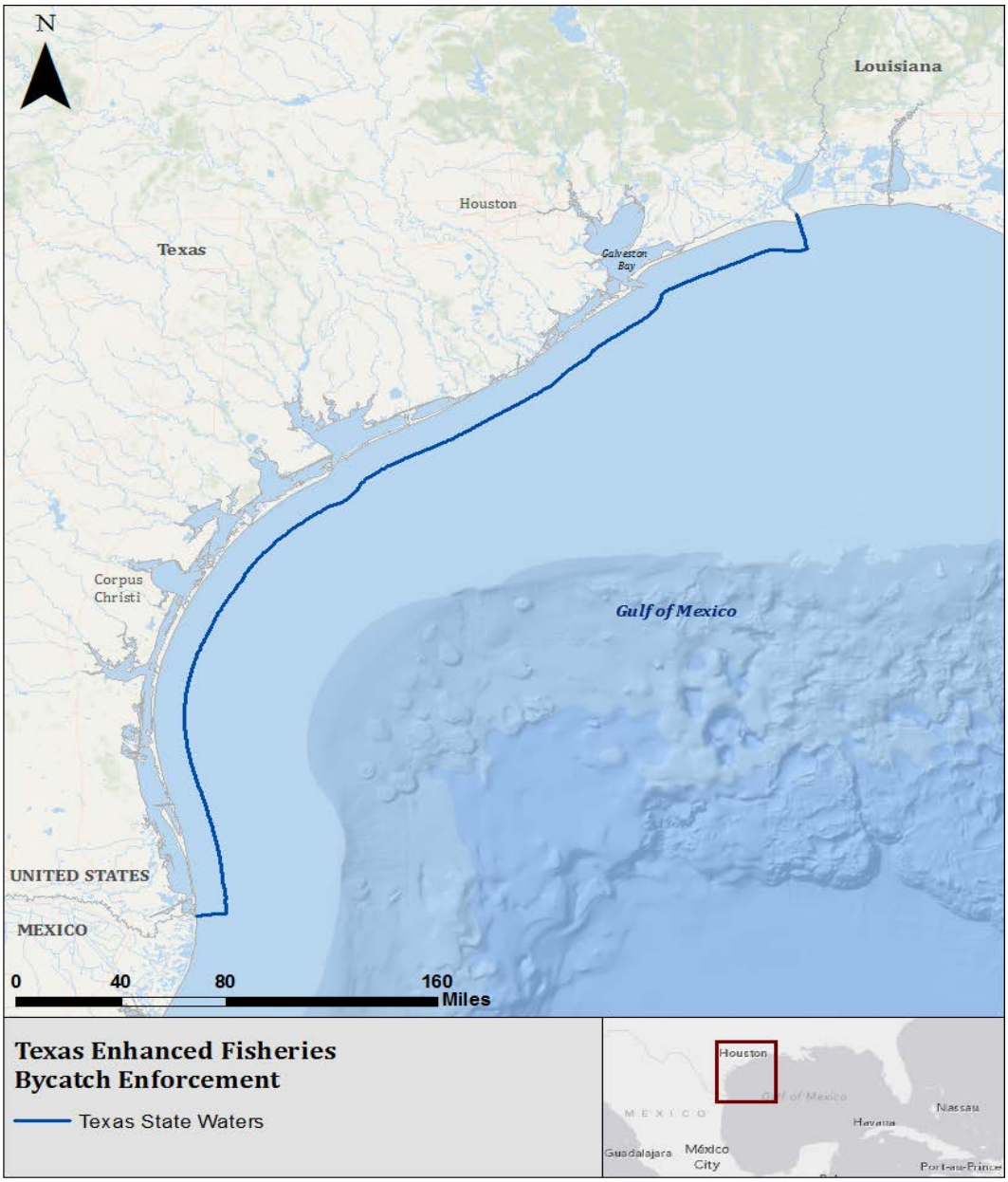


13.1.3.4 Texas Enhanced Fisheries Bycatch Enforcement

Funds for the Texas Enhanced Fisheries Bycatch Enforcement project component will be used to enhance TPWD enforcement activities for fisheries that incidentally catch sea turtles while they operate primarily in Texas State waters (approximately 367 miles of coast line out to 9 nautical miles) and the exclusive economic zone (EEZ) off Texas within the Gulf of Mexico for a 10-year period (Figure 13-11). These increased enforcement operations will focus on compliance with TED regulations during the Gulf shrimp fishery season (primarily February through mid-May) right before the Gulf closes to shrimping in May. Patrols will be targeted during this timeframe because it is the beginning of the nesting season and an active time for shrimp fishing. Previous efforts to increase enforcement activities during this time period have had a positive impact on compliance rates, reducing the number of observed strandings during this time period. The primary goal of this project component is to reduce sea turtle mortalities through increased compliance with TED regulations as a result of increased enforcement actions.

The project component will include a series of patrols focusing on the enforcement of TED regulations in the Gulf of Mexico along the entire Texas coast ensuring compliance aboard commercial shrimp vessels (Figure 13-12). Targeted patrols will primarily occur during the period of the year when sea turtle strandings have historically been the highest. These patrols will be over and above the current patrol frequency in the Texas state waters of the Gulf of Mexico.

Figure 13-11. Texas Enhanced Fisheries Bycatch Enforcement geographic scope



The vessels associated with this type of open sea enforcement activities are mid-range patrol vessels with a crew of three Game Wardens and long-range patrol vessels with a crew of four Game Wardens. There are thirteen mid-range patrol vessels and two long-range patrol vessels along the coast. TPWD expects to provide about 200 boat hours of mid-range patrol and boat 80 hours of long-range patrol to enhance enforcement of TEDs. Hours may be shifted between the types of vessel as weather or patrols demand.

Figure 13-12. TPWD law enforcement wardens taking a course on TED compliance inspections

Photo credit: Texas Parks and Widlife Department



13.1.4 Evaluation Criteria

The Sea Turtle Early Restoration project meets the evaluation criteria established by OPA and the Framework Agreement. The project will restore and protect sea turtles, helping to offset adverse impacts to these resources caused by the Spill. The project has a nexus to the *Deepwater Horizon* oil spill (Spill) (see 15 C.F.R. § 990.54(a)(2) and is consistent with Sections 6a-6e of the Framework Agreement). Sea turtles were exposed to oil in open water and in *Sargassum* habitat, through ingestion, direct contact, and inhalation of volatile oil and dispersant-related compounds. In addition, response activities, such as collecting and burning oil at sea, skimmer operations, boom deployment, berm construction, increased lighting and activity at night on and near nesting beaches, beach cleanup operations and boat traffic may have injured sea turtles directly or by blocking access to turtle nesting beaches and changing their reproductive behavior.

The project is technically feasible; it uses proven techniques with established methods and documented results, and can be implemented with minimal delay. For these reasons, the project has a high likelihood

of success (see 15 C.F.R. § 990.54(a)(3) and Section 6e of the Framework Agreement). Cost estimates are based on known program operational costs, and demonstrate that the project can be conducted at a reasonable cost (see 15 C.F.R. § 990.54(a)(1) and Section 6e of the Framework Agreement). As a result, the project is considered feasible and cost effective (see 15 C.F.R. § 990.54(a)(1) and (3)).

Collateral injury will be avoided and minimized during project implementation (construction, operations, and maintenance) (15 C.F.R. § 990.54(a)(4)). A thorough environmental assessment, including review under applicable environmental regulations, is described in Sections 13.2.4, 13.2.5 and 13.2.6. The environmental assessment indicates that adverse effects from the project will largely be minor, localized, and often of short duration.

13.1.5 Performance Criteria and Monitoring

The Sea Turtle Early Restoration project builds on several existing and well established programs for the protection and recovery of sea turtles that are operated by federal and state agencies. Specific monitoring plans will be in place to ensure that these programs, as enhanced, are accomplishing the project's restoration objectives and reaching established milestones. The monitoring will be designed to assess the effectiveness of the project's components at achieving reductions in sea turtle mortalities, through confirmation of their effectiveness at achieving enhancements of the ability to respond to and rehabilitate injured sea turtles, increased nest detection and protections, and improvements in compliance with existing TED regulations. Monitoring for these objectives will include tracking the number of surveys completed, inspections completed, trainings offered, and the improvements to response during emergency events. The full monitoring plan for the Sea Turtle Early Restoration Project is found in Appendix B[3].

13.1.6 Project Management/Maintenance

The Sea Turtle Early Restoration project builds on several existing and well-established programs that are operated by federal and state agencies. NOAA, DOI and the Texas Trustees will be developing contracts and agreements with organizations that will implement portions of the project, and the Trustees will establish program management processes to help evaluate and enforce contract/agreement compliance by program participants.

The project will use and expand existing resources and programs (i.e. NOAA's oversight of the STSSN, DOI's oversight of nesting programs), which will provide the Sea Turtle Early Restoration Project managers with the ability to monitor program activities.

Vehicles and equipment will be purchased and maintained for the serviceable life of the equipment during the life of the project (10 years). In addition, cabins and sea turtle nesting corrals will be built and

[3] BP and the Trustees agreed to work together to develop the monitoring plans for this project. The monitoring plan included in Appendix B has been updated and is the final plan developed with BP.

used. For specifics about what will be purchased and where it will be located, see Sections 13.2.4 – 13.2.8 as well as the monitoring plans (Section 13.1.5 and Appendix B).

13.1.7 Offsets

The Sea Turtle Early Restoration project is a multi-faceted approach to sea turtle restoration that addresses a variety of species and life stages in order to begin restoring for injuries that occurred throughout the Gulf as a result of the Spill. All sea turtle species are listed as either threatened or endangered under the Endangered Species Act. Sea turtles face numerous threats throughout their life histories. Many factors were considered when developing the Offsets for this restoration project. The Offsets for this project are dependent upon concurrent implementation of all four project components in this chapter.

For purposes of negotiating Offsets with BP in accordance with the Framework Agreement, the Trustees used a Resource Equivalency Analysis to estimate sea turtle Offsets. Sea turtle Offsets (expressed in discounted adult reproductive equivalents) were estimated by calculating either reduced mortality or increased survival of sea turtles by life stage for the restoration components that will be expected to occur over the duration of project implementation compared to a no-action scenario. The project is expected to: reduce sea turtle hatchling mortalities through continued support for nest detection and protection activities in Texas and Mexico; increase the likelihood that juvenile and adult sea turtles will be located, triaged, successfully rehabilitated and released through improvements to the STSSN and development and implementation of a Gulf of Mexico Emergency Response Program; and reduce juvenile and adult sea turtle bycatch mortalities through increased compliance with federal TED regulations as a result of increased education, outreach, and enforcement actions. If this restoration project is selected for implementation and funding, the Trustees and BP agreed that BP will receive the following Offsets:

- For Kemp's ridley sea turtles, NRD Offsets are 1309 discounted adult reproductive equivalents in the Gulf of Mexico. These Offsets are only applicable to Kemp's ridley sea turtle injuries in the Gulf States and in the Gulf of Mexico as determined by the Trustees' total assessment of injury for the Spill.
- For green sea turtles, NRD Offsets are 215 discounted adult reproductive equivalents in the Gulf States and in the Gulf of Mexico . These Offsets are only applicable to green sea turtle injuries in the Gulf of Mexico, as determined by the Trustees' total assessment of injury for the Spill.
- For loggerhead sea turtles, NRD Offsets are 40 discounted adult reproductive equivalents in the Gulf of Mexico. These Offsets are only applicable to loggerhead sea turtle injuries in the Gulf States and in the Gulf of Mexico, as determined by the Trustees' total assessment of injury for the Spill.

The unit of "discounted adult reproductive equivalents" uses a discounting rate to convert the number of adult reproductive equivalents to a common base year for comparison. Discounted Kemp's ridley, green, and loggerhead sea turtle Offsets were estimated because these species, in particular, are

expected to benefit from the restoration actions. Several life history, project, and local stochastic factors were used to develop sea turtle Offsets, including nest densities, eggs per nest, influence of storms on hatching success, the spatial extent expected to be used for nesting, age-based survival rates, and the longevity of the project. If the Sea Turtle Early Restoration project is selected for implementation, these Offsets will, in the future, be credited against the Trustees' assessment of total injury to these sea turtle species resulting from the Spill.

13.1.8 Estimated Costs

The total estimated cost to implement this Project is $45,000,000. This estimate uses the most current cost information available to the Trustees at the time of the project negotiation. The estimated costs include provisions for personnel, supplies, equipment, fuel, education activities, equipment maintenance, engineering and design, construction of the cabins, monitoring, and contingencies. The following table shows this estimate by component.

Table 13-1. Sea Turtle Early Restoration Project Estimated Costs

Sea Turtle Early Restoration Project Components	**Total***
Kemp's Ridley Sea Turtle Nest Detection and Enhancement	**$11.17 M**
Texas Activities	*$6.29 M*
Mexico Activities	*$4.88 M*
Enhancement of the Sea Turtle Stranding and Salvage Network (STSSN) and Development of an Emergency Response Program	**$20.13 M**
NOAA's Enhancement of the Gulf-Wide Sea Turtle Stranding and Salvage Network and Salvage Network and Development of a Sea Turtle Emergency Response Program	$13.59 M
Enhancement of the Sea Turtle Stranding and Salvage Network and Rehabilitation Efforts in Texas	$6.54 M
Gulf of Mexico Shrimp Trawl Bycatch Reduction	**$11.9 M**
Gulf of Mexico Gear Monitoring Team Enhancement	$7.75 M
Southeast Shrimp Trawl Fisheries Observer Program Enhancement	$4.15 M
Texas Enhanced Fisheries Bycatch Enforcement	**$1.8 M**
Sea Turtle Early Restoration Project TOTAL	**$45 M**

*Base Project, Contingency, Trustee Oversight and Monitoring. Figures are necessarily approximate, as they include portions of estimated general project costs that will be used for multiple components (e.g., Trustee oversight costs).

13.2 Sea Turtle Early Restoration Project: Environmental Assessment

The Sea Turtle Early Restoration project involves a suite of actions to restore and protect sea turtles in the Gulf of Mexico. The Sea Turtle Early Restoration project consists of four project components: (1) Kemp's Ridley Sea Turtle Nest Detection and Enhancement; (2) Enhancement of the Sea Turtle Stranding and Salvage Network and Development of an Emergency Response Program; (3) Gulf of Mexico Shrimp Trawl Bycatch Reduction; and (4) Texas Enhanced Fisheries Bycatch Enforcement. The proposed project components would build on existing and well-established programs that are operated by federal and state agencies within the Gulf of Mexico, and would work to increase the survival of hatchling Kemp's ridley sea turtles, and reduce mortality of Kemp's ridley, loggerhead, and green sea turtles.

13.2.1 Introduction and Background, Purpose and Need

13.2.1.1 Introduction

This project is proposed as part of Phase IV of the Early Restoration program. This Environmental Assessment (EA) tiers from the 2014 Final Phase III ERP/PEIS which provides broad, programmatic environmental analyses of project types for Final Phase III and future phases of Early Restoration. This EA qualifies for tiering from the Final Phase III ERP/PEIS in accordance with Department of the Interior regulations (43 CFR 46.140, Using tiered documents) under "b" and "c" (Section 1.6.2, Basis for Tiering). This tiering is also consistent with NOAA Administrative Order 216-6, "Environmental Review Procedures for Implementing the National Environmental Policy Act" (Section 5.09c). This project is consistent with the project type, "Restore and Protect Sea Turtles", which was included in the Preferred Alternative "Contribute to Restoring Habitats and Living Coastal and Marine Resources". By tiering, this EA provides the requisite additional detail for a project-level NEPA analysis that considers potential site specific impacts anticipated from implementation of the proposed action and the no action alternative. See Chapter 1.3 for information on the Final Phase III ERP/PEIS and tiering of the Phase IV proposed projects.

This project is consistent with the Final Phase III ERP/PEIS Preferred Alternative as described and selected in the 2014 Record of Decision (79 FR 64831-64832; October 31, 2014) and the Trustees find that the conditions and environmental effects described in that broader NEPA document (with updates as described in Chapter 2 of this document) are still valid. Specifically, the EA for the proposed Sea Turtle Project tiers from the analyses found in the following sections of the PEIS:

- Chapter 5: Proposed Early Restoration Programmatic Plan: Development and Evaluation of Alternatives: Descriptions of Alternatives 2 (Section 5.5.3 Contribute to Restoring Habitats and Living Coastal and Marine Resources) and 4 (Section 5.3.7 Preferred Alternative: Contribute to Restoring Habitats, Living Coastal and Marine Resources and Recreational Opportunities), Section 5.3.3.9 Restore and Protect Sea Turtles.
- Chapter 6: Environmental Consequences, Section 6.3.9, Project Type 9: Restore and Protect Sea Turtles, and 6.4, Alternatives 2 (and 4): Human Uses and Socioeconomics.
- Chapter 6.8: Potential Cumulative Impacts

This EA incorporates by reference the analysis found in those sections of the Final Phase III PEIS. This EA also incorporates by reference all introductory, process, background, and Affected Environment information and discussion related to Early Restoration provided in the PEIS (Chapters 1 through 6).

The proposed Sea Turtle Early Restoration project is analyzed and described in subsequent sections as one Environmental Assessment composed of three sections, based on observed similarities between the four components that comprise the project. Furthermore, subsections within components are, in many cases, very similar in regards to the potential impact to physical, biological, and socioeconomic resources. These similarities make it possible to analyze the four components of the proposed project in three sections. Each of the three sections includes detailed discussion of resources potentially involved with the proposed project. The three sections of the proposed project EA are:

1) Kemp's ridley Sea Turtle Nest Detection and Enhancement (Section 13.2.4).

2) Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program (Section 13.2.6).

3) Gulf of Mexico Shrimp Trawl Bycatch Reduction and Texas Enhanced Fisheries Bycatch Enforcement (this section combines two project components) (Section 13.2.8).

13.2.1.2 Background

The Gulf of Mexico provides important habitat for multiple life stages of four species of hardshell sea turtles and the leatherback turtle. Turtles nest and eggs incubate on sandy beaches and newly emerged hatchlings make their way offshore, taking up residence in S*argassum* habitat in open ocean areas (i.e., continental shelf). Eventually, juvenile turtles recruit to coastal areas and juveniles and adults are most often found on the continental shelf, including shallow nearshore and inshore habitats. Less is known about the Gulf of Mexico distribution of leatherback turtles but they have a more pelagic existence, feeding on soft bodied organisms, including jellyfish and salps. They may also feed nearshore depending on the distribution of their prey. The presence of sea turtles in various Gulf of Mexico habitats increases nutrient cycling, balances the food web, and is critical to maintaining the health, function, and resiliency of the Gulf ecosystem as a whole.

Primary threats to sea turtle populations include bycatch in fishing gear, loss and degradation of marine and estuarine habitats (e.g., shallow coral and seagrass), destruction and degradation of nesting beaches (including artificial lighting), loss and degradation of foraging areas, and nest predation (NOAA 2011b).

As a result of the Spill, sea turtles were exposed to oil in open water, in *Sargassum* habitat, or on nesting beaches, either through ingestion of oil, direct contact with oil, and/or inhalation of volatile oil and dispersant-related compounds. In addition, response activities, such as collecting and burning oil at sea, skimmer operations, boom deployment, berm construction, increased lighting and activity at night near and on nesting beaches, beach cleanup operations and boat traffic may have injured sea turtles directly or by blocking access to turtle nesting beaches and changing their reproductive behavior.

The 1996 Magnuson-Stevens Fishery and Conservation Act requires cooperation among NOAA Fisheries, the fishing community, and federal and state agencies to protect, conserve, and enhance Essential Fish Habitat (EFH). EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. The designation and conservation of EFH seek to minimize adverse effects on habitat caused by fishing and non-fishing activities. NOAA's Estuarine Living Marine Resources Program developed a database on the distribution, relative abundance, and life history characteristics of ecologically and economically important fishes and invertebrates in the nation's estuaries. NOAA has designated EFH for more than 30 estuaries in the northern Gulf of Mexico for a number of species of finfish and shellfish. A detailed description of EFH in the Gulf of Mexico can be found in Appendix A-2 of the Final Phase III ERP/PEIS.

USFWS and NMFS lists species as threatened or endangered when they meet criteria detailed under the ESA of 1973, as amended (16 U.S.C. §1531 et seq.). Section 7(a)(2) of the ESA requires that each federal agency ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of those species. When the action of a federal agency may affect a protected species or its critical habitat, that agency is required to consult with either the NMFS or the USFWS, depending upon the protected species that may be affected. The Trustees reviewed the proposed project for compliance with Section 7 of the Endangered Species Act of 1973 (ESA), as amended, and determined the proposed project has been the subject of a number of consultations or permitting actions under the ESA, and that no further consultation with USFWS is necessary. Those analyses were summarized and provided in a memorandum to the appropriate USFWS Ecological Services offices in Florida, Alabama, Mississippi, Louisiana and Texas for their information, and no further concurrence is necessary. ESA Section 7 consultation (NOAA jurisdiction) has been initiated with NMFS. A discussion of listed sea turtle species is provided below and is intended to cover all four project components and environmental assessments.

13.2.1.2.1 Sea Turtle Species

As described in Section 3.3.2.6 of the Final Phase III ERP PEIS, there are five species of sea turtles found within the Gulf of Mexico, all of which are listed under the ESA. All five species are highly migratory with a wide geographic range, which includes the entire Gulf of Mexico. All of these sea turtle species could potentially occur in the project areas for the proposed Sea Turtle Early Restoration project. To limit redundancy, Table 13-2 summarizes the status of these five sea turtles, with additional information provided following the table. A more detailed discussion of these five sea turtle species can be found in Appendix A.5 of the Final Phase III ERP PEIS.

Table 13-2. Threatened and endangered sea turtles of the Gulf of Mexico

COMMON NAME	FEDERAL STATUS	USE OF GULF OF MEXICO
Loggerhead sea turtle	9 Distinct Population Segments (DPSs) – 4 listed as threatened (Northwest Atlantic Ocean, South Atlantic Ocean, Southwest Indian Ocean, and Southeast Indo-Pacific Ocean DPSs) and 5 listed as endangered (Northeast Atlantic Ocean, Mediterranean Sea, North Pacific Ocean, South Pacific Ocean, and North Indian Ocean DPSs).	The Northwest Atlantic Ocean DPS uses oceanic and continental shelf waters (including shallow inshore habitats) of the Gulf of Mexico from Mexico to Florida; nesting occurs on Gulf Coast beaches primarily in Florida and Alabama, with limited nesting in Mississippi, Louisiana, and Texas. Critical habitat has been designated and includes certain habitats in the Gulf of Mexico.
Green sea turtle	Breeding populations in Florida and on the Pacific Coast of Mexico are listed as Endangered; all others are listed as Threatened. The green turtle listing is currently proposed for revision: twelve DPSs have been proposed (3 endangered and 8 threatened).	The oceanic and continental shelf waters (including shallow inshore habitats) of the Gulf of Mexico from Mexico to Florida; nesting occurs primarily in Florida, with limited nesting in Texas.
Hawksbill sea turtle	Endangered	The oceanic and continental shelf waters (including nearshore habitats) of the Gulf of Mexico from Mexico to Florida; limited nesting occurs in Florida.
Kemp's ridley sea turtle	Endangered	The oceanic and continental shelf waters (including shallow inshore habitats) of the Gulf of Mexico from Mexico to Florida; nesting occurs primarily in Mexico, with some nesting in Texas.
Leatherback sea turtle	Endangered	The oceanic and continental shelf waters of the Gulf of Mexico from Mexico to Florida; limited nesting occurs in Florida and Texas.

Loggerhead Sea Turtle (*Caretta caretta*): Loggerhead sea turtles nest on ocean beaches, generally preferring high energy, relatively narrow, steeply sloped, coarse-grained beaches. Immediately after hatchlings emerge from the nest they begin a period of frenzied activity and travel to areas where surface waters converge to form local down-wellings in oceanic waters. They are most often associated with *Sargassum* habitats where they find food and shelter. At approximately 7-12 years, juvenile loggerheads migrate to coastal and inshore waters on the continental shelf where they mature. Adult loggerheads are generally found on the continental shelf including shallow nearshore areas as well as deeper shelf waters. Loggerheads primarily forage on mollusks, crustaceans, sponge, and other marine organisms. Major nesting concentrations in the U.S. are found from North Carolina through southwest Florida. Adult loggerheads are known to make extensive migrations between foraging areas and nesting beaches. During non-nesting years, adult females from U.S. beaches are distributed in waters off the eastern U.S. and throughout the Gulf of Mexico, Bahamas, Greater Antilles, and Yucatán (http://www.nmfs.noaa.gov/pr/species/turtles/loggerhead.htm).

Green Sea Turtle (*Chelonia mydas*): In the Gulf of Mexico green turtles nest primarily in Mexico and along the southwest Florida coast beginning in late May and continuing into September. Newly emerged hatchlings migrate offshore and migrate to areas where surface waters converge to form local down-wellings in oceanic waters, where they live for several years, feeding close to the surface on a variety of pelagic plants and animals. Once the juveniles reach a certain age/size range, they leave the pelagic habitat and migrate to nearshore foraging grounds. Once they move to these nearshore benthic habitats, green turtles are almost exclusively herbivores, feeding on sea grasses and algae (http://www.nmfs.noaa.gov/pr/species/turtles/green.htm).

Hawksbill Sea Turtle (*Eretmochelys imbricata*): In the Gulf of Mexico, hawksbill sea turtles nest along the Gulf coast of Mexico. Hawksbill sea turtles use various habitats such as the open ocean, bays, and estuaries throughout different life stages, but are mainly associated with coral reefs. Within the continental U.S., nesting is restricted to the southeast coast of Florida and the Florida Keys, but nesting is rare in these areas. The main dietary items of this species are sponges and other invertebrates (http://www.nmfs.noaa.gov/pr/species/turtles/hawksbill.htm).

Kemp's Ridley Sea Turtle (*Lepidochelys kempii*): Adult and juvenile Kemp's ridley turtles primarily occupy neritic habitats, which typically contain muddy or sandy bottoms where preferred prey, typically crabs, can be found. The nesting season occurs from April through July and nesting is concentrated in the state of Tamaulipas, Mexico. Although the majority of Kemp's ridley nesting occurs in Mexico (USFWS 1970), some nesting also occurs along the Texas Gulf coast. Male Kemp's ridleys appear to occupy many different areas within the Gulf of Mexico. Some males migrate annually between feeding and breeding grounds, yet others may not migrate at all, mating with females opportunistically encountered. Immediately after hatchlings emerge from the nest they begin a period of frenzied activity and travel to areas where surface waters converge to form local down-wellings in oceanic waters, where they live for several years, feeding close to the surface on a variety of pelagic plants and animals. Once the juveniles reach a certain age/size range, they leave the pelagic habitat and migrate to nearshore foraging grounds on the continental shelf. Their diet consists mainly of swimming crabs, but may also include fish, jellyfish, and an array of mollusks (http://www.nmfs.noaa.gov/pr/species/turtles/kempsridley.htm).

Leatherback Sea Turtle (*Dermochelys coriacea*): Leatherback sea turtles are the most pelagic of the sea turtle species, spending considerable time in deep ocean waters, but also regularly occur on the continental shelf and often in close proximity to shore depending on prey distribution. The species feeds almost exclusively on jellyfish and salps. Nesting for this species occurs from April through November with significant nesting in southeast Florida. Leatherback nesting is sparse along the Gulf of Mexico U.S. coast (http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm).

13.2.1.3 Purpose and Need

The proposed action falls within the scope of the programmatic purpose and need for early restoration as described in the Final Phase III ERP/PEIS because it will accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. The proposed project's purpose is to begin

to restore and protect sea turtles injured as a result of the Spill. The project is a multi-faceted approach to such restoration that collectively addresses identified needs for a variety of species and life stages of sea turtles, consistent with long-term recovery plans and plan objectives for sea turtles in the Gulf of Mexico. The project is needed to enhance and facilitate the recovery of sea turtles in the Gulf of Mexico by increasing the number of hatchlings and decreasing juvenile and adult mortality through reducing bycatch and improved response to sea turtle strandings. Without this suite of actions, the existing programs would continue with limited funding and ability to maintain the long-term goals for these protected species.

13.2.2 Scope of the EA

This project is proposed as part of the Phase IV Early Restoration Plan. The broader environmental analyses of these types of actions as a whole are discussed in the Final Phase III ERP/PEIS from which this EA is tiered. The information and analyses in this document supplements the programmatic analyses with site-specific information. This EA provides NEPA analysis for potential impacts for site specific issues and concerns anticipated from implementation of the proposed actions and the no action alternative.

Under the NEPA, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

In order to determine whether an action has the potential to result in significant impacts, the **context and intensity** of the action must be considered. **Context** refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). **Intensity** refers to the severity of impact and could include the timing of the action (e.g., more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse.

For purposes of this document, impacts are characterized as minor, moderate or major, and temporary or long-term. The definition of these characterizations is consistent with that used in the Final Phase III ERP/PEIS, and can be found in Appendix D. As discussed above, the proposed project was divided into three sections within the EA based on similar activities within project components and level of potential involvement with physical, biological, and socioeconomic resources (i.e. the Gulf of Mexico Shrimp Trawl Bycatch Reduction and Texas Enhanced Fisheries Bycatch Enforcement project components both involve similar activities that would be primarily water based with minimal land based activities and neither involves new construction of any kind).

13.2.3 Project Alternatives

Both OPA and NEPA require consideration of the No Action alternative. For this section, there are two alternatives, No Action and Proposed Actions of the Sea Turtle Early Restoration project.

13.2.3.1 No Action

Both OPA and NEPA require consideration of the No Action alternative. For this Phase IV DERP proposed project, the No Action alternative assumes that the Trustees would not pursue the actions comprising the Sea Turtle Early Restoration project as part of Phase IV Early Restoration.

Under No Action, the existing conditions described for sea turtle resources in the affected environment subsections would prevail. Restoration benefits associated with this project would not be achieved at this time.

Section 1502.14(d) of the CEQ Regulations requires the alternatives analysis to "include the alternative of no action." CEQ states that in some cases "no action" is "no change" from current management direction or level of management intensity. Therefore, the "no action" alternative may be thought of in terms of continuing with the present course of action until that action is changed. Projected impacts of proposed actions would be compared to those impacts projected for the existing actions. In this case, all components of the Sea Turtle Early Restoration project are currently being conducted under existing programs and policies, some of which have been in existence for many years. Therefore, the No Action alternative is a continuation of these existing programs and policies, without the additional funding, staffing, infrastructure and enhancements of the proposed action. However, funding support for each of the programs is highly variable and the level of effort may not remain constant year to year.

13.2.3.2 Proposed Actions

Implement the Sea Turtle Early Restoration project through a suite of proposed actions:

- Kemp's Ridley Sea Turtle Nest Detection and Enhancement
- Enhancement of the Sea Turtle Stranding and Salvage Network and Development of an Emergency Response Program
- Gulf of Mexico Shrimp Trawl Bycatch Reduction
- Texas Enhanced Fisheries Bycatch Enforcement

13.2.3.3 Other Alternatives Considered but Not Analyzed

The Trustees' Early Restoration project selection process is described in Section 2.1 of the Final Phase III ERP/PEIS. As described there, potential projects evolve from public scoping, ongoing public input through internet-accessible databases, review of current federal and state management plans and programs, and Trustee expertise and experience. From this broad list of project ideas, the Trustee's Early Restoration project selection process initially resulted in a set of proposed projects that, consistent with the Framework Agreement, were submitted to BP for review and consideration. One area considered for Early Restoration included restoration for injured sea turtles, and in particular, focused on bycatch reduction and enhancements to observer programs and gear monitoring, the sea turtle stranding and salvage network, and Kemp's ridley nest detection as approaches to restore and protect lost sea turtles. The restoration and recovery efforts associated with each project component are recommended recovery actions in established recovery plans for Kemp's ridley, green, and loggerhead

sea turtles. The Trustees used these recovery plans and developed project components for early restoration that met the recommendations of the recovery plans and that were feasible within the context of the Framework Agreement.

During the Phase IV Early Restoration project development process, the Trustees considered alternatives for sea turtle early restoration that reflected variations to the project scope and duration of each component, as well as different arrangements of components. When considering the project component Enhancement of the Sea Turtle Stranding and Salvage Network and Development of the Emergency Response Program, the Trustees considered an alternative that did not include the Emergency Response portion. Ultimately, the Trustees included the Emergency Response Program because it was found to be an effective addition to the early restoration project that would create the greatest benefit to the resource when combined with actions to enhance the STSSN. When considering the duration of this project component, as well as the Kemp's Ridley Sea Turtle Nest Detection and Enhancement, Shrimp Trawl Bycatch Reduction and the Texas Enhanced Fisheries Bycatch Enforcement project components, the Trustees initially considered alternatives that defined the project durations as 5 or 6 years depending on the project component, instead of 10 years. These shorter duration alternatives proved to be infeasible in the context of the Framework Agreement.

While these alternatives were initially considered by the Trustees, it was determined that the alternative resulting from inclusion of the Emergency Response Program and setting the duration of the various project components at 10 years was the most appropriate alternative. Therefore, the proposed alternative provides the greatest benefit for sea turtle restoration over all other early options considered.

13.2.4 Kemp's Ridley Sea Turtle Nest Detection and Enhancement

The location, scope, operations and maintenance, as well as affected environment and environmental consequences for the Kemp's Ridley Sea Turtle Nest Detection and Enhancement project component are discussed in the following subsections.

Consultations and environmental reviews under the Endangered Species Act (ESA) of 1973, Magnuson-Stevens Fishery and Conservation Act , Marine Mammal Protection Act of 1972, Migratory Bird Treaty Act of 1918, Bald and Golden Eagle Protection Act of 1940, National Historic Preservation Act, and Coastal Zone Management Act of 1972 are required for this project component. Consultations and environmental reviews under the MSFCMA and the CZMA have been completed for this Phase IV plan.

To fulfill requirements and obligations under ESA, the Trustees initiated consultations pursuant to Section 7 of the ESA, as amended (16 U.S.C. 1531 et seq.) with the NMFS SERO's Protected Resources Division and the USFWS Texas Coastal Ecological Services Field Office.

The Trustees also reviewed the proposed project for impacts to bald eagles and migratory birds in accordance with the BGEPA and the MBTA and determined take would be avoided (DOI 2015). Refer to Phase IV ERP/EA Chapter 13, sections 13.2.5.4.2; 13.2.7.2.2; and 13.2.9.2.2.

Pursuant to Section 106 of the NHPA, a complete review of this project is ongoing to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Pursuant to the MSFCMA, NOAA and DOI reviewed the Sea Turtle Early Restoration Project for compliance with the MSFCMA, and had informational discussions with NMFS Southeast Regional Office (SERO's) Habitat Conservation Division (HCD) regarding Essential Fish Habitats (EFH). NOAA determined the project is not likely to adversely impact any EFH identified in the Gulf of Mexico Fishery Management Council's 2005 Generic EFH Amendment, or the NMFS Highly Migratory Species Fishery Management Plan. The SERO's HCD concurred with this and therefore concluded no consultation was required for the sea turtle project actions.

Pursuant to the MMPA, the Trustees have coordinated with NOAA SERO to determine that this project does not require authorization under the MMPA.

Pursuant to the CZMA, the Federal Trustees submitted a consistency determination for this project to the Texas General Land Office, the Louisiana Office of Coastal Management, the Mississippi Department of Marine Resources, the Alabama Department of Environmental Management, and the Florida Department of Environmental Protection via letters on May 21, 2015. Between June 22 and July 10, 2015, each of these agencies responded concurring with that determination of consistency on behalf of its state. As noted in several of the state responses, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in each state, as may be applicable.

Funding for this proposed project component would provide needed support for additional staff, training, equipment, supplies and vehicles over a 10-year period in both Texas and Mexico. The project component would also provide for the addition of two cabins and two nesting corrals on the southern end of the PAIS. The primary goal of this project component is to reduce sea turtle hatchling mortalities through continued support for nest detection and protection activities in Texas and Mexico as part of the ongoing Kemp's ridley recovery efforts.

13.2.4.1 Project Component Location

The enhanced nest detection activities of this project component could be implemented anywhere along the coastal beaches of Texas and along the coast of Tamaulipas, Mexico where Kemp's ridley sea turtles nest. The cabin and corral construction would be located in the southern end of PAIS. The two new cabins would be located on the beach near the 30-mile mark and the 50-mile mark (See Section 13.1.3.11, Figure 13-3).

13.2.4.2 Project Component Scope

This project component would provide funding to support ongoing conservation efforts for the Kemp's ridley sea turtle. The Recovery Plan for the Kemp's ridley outlines a recovery strategy that includes nest detection and protection (SEMARNAT 2011). The primary goal of this project component is to reduce sea turtle hatchling mortalities through continued support for nest detection and protection activities in Texas and Mexico as part of the ongoing Kemp's ridley recovery efforts. This portion of the proposed restoration project component would maintain, improve, and/or enhance current nest detection, egg relocation, and nest protection efforts in Texas and Mexico. Funding for this proposed project component would provide needed support for additional staff, training, equipment, supplies and vehicles over a 10-year period in both Texas and Mexico. The project component would also provide for the construction of two cabins and two nesting corrals on the southern end of the PAIS. See Section 13.1.3.1 for additional details about the Kemp's ridley sea turtle nest detection and enhancement project component.

13.2.4.3 Construction and Installation

The only construction element of this project component is construction of the two cabins and installation of associated corrals on PAIS.

The new sea turtle patrol cabins would be wood frame construction, elevated on pilings, each approximately 2,500 square feet in size. Rough dimensions for the new cabin design are 50 feet wide by 40 feet long, with a 10 feet deep deck, making the total footprint for the building to be 50 feet by 50 feet. The interior of the building would include sleeping quarters for up to 23 people, two full bathrooms, a kitchen, office and living space, storage area, and basic operational space to support the program. With the remote backcountry location for the cabins, they would be equipped with solar powered photovoltaic cells to provide a small amount of electricity for lighting and communications. Propane gas would power the stove and cool the refrigerator. A fire protection system for the cabins would consist of smoke alarms, with fire exits in the building. The cabins would not be equipped with modern climate control systems, i.e., there would be no heating, ventilation, or air conditioning included. Since the cabins are for a specialized use and are not open to the public, they would not be Americans with Disabilities Act compliant.

The National Seashore allows for beach driving; therefore, access to the new sea turtle patrol cabins would be via the Gulf of Mexico shoreline. An area near each of the proposed sites for the new sea turtle patrol cabins would be designated for construction staging, material stockpiling, and equipment storage. These areas would likely be sited in areas somewhere along the Gulf of Mexico beach, where disturbances from beach driving and tidal flows already occur. The staging areas would be designated in areas that would neither impede beach vehicle traffic nor pose a collision safety risk to visitors', contractors', and park staff's vehicles. A temporary housing facility (travel trailer) would be located at the project areas during construction. This would allow for all eight to ten hours of work time to be applied to construction of the cabins, rather than time being spent commuting to the project areas. After completion of the cabins, the travel trailer would be removed from each of the project areas.

Currently, the areas where the temporary housing facility would be are sites available to visitors for backcountry camping. The existing forbs and grasses in the project area would be preserved to the extent possible. All areas disturbed by construction of the new sea turtle patrol cabins would be revegetated and recontoured to the style of the native landscape. Native vegetation, topography, or other natural features would be used, as appropriate. The area disturbed by construction of incubation facility expansion would be leveled and reseeded with native grasses.

An area near the cabins would be designated to contain a corral for sea turtle eggs, which would be collected for incubation, hatching, and release. Having the corrals in the proposed areas would reduce transport time of the sea turtle eggs that were collected in the southern part of the park; therefore reducing the risk of injury or damage to the viable eggs. The corral would be fenced and locked.

See the Expansion of Facilities Supporting Sea Turtle Science and Recovery, Construction of Patrol Cabins and Expansion of Incubation Laboratory, 2011 Environmental Assessment from the National Park Service (hereinafter referred to as NPS EA) in Appendix F for more information. As the title suggests, the NPS EA also analyzes impacts from construction of an addition to the incubation laboratory, which is not part of the proposed Phase IV NRDA Sea Turtle Early Restoration Project.

13.2.4.4 Operations and Maintenance

The proposed Kemp's ridley sea turtle nest detection and enhancement project component builds on existing and well established programs that are operated by federal and state agencies in coordination with universities and NGOs. Operational protocols, training and permitting have been established over the last two decades. The proposed Kemp's ridley nest detection activities would operate under the same set of management plans currently existing for these programs. There would be no change to operations. The cabins would be maintained as part of normal NPS maintenance and upkeep polices for PAIS and operated under the same operational protocols previously developed by the program.

13.2.4.5 Previous Environmental Analysis for Cabin and Corral Construction

The construction of the cabins and associated corrals was previously evaluated under NEPA by the NPS. DOI regulations for implementing NEPA provide that a DOI bureau may adopt an EA prepared by another agency [see 43 C.F.R. § 46.320]. To complete partial NEPA analysis for this component of the proposed action, DOI is adopting the NPS EA entitled "Expansion of Facilities Supporting Sea Turtle Science and Recovery, Construction of Patrol Cabins and Expansion of Incubation Laboratory, 2011." (See Chapter 4, Section 4.13 for information regarding adopting NEPA documents).

The NPS EA was prepared in compliance with NEPA to provide the decision-making framework that 1) analyzed a reasonable range of alternatives to meet objectives of the proposal, 2) evaluated potential issues and impacts to PAIS's resources and values, and 3) identified mitigation measures to lessen the degree or extent of these impacts.

DOI has independently evaluated the NPS EA and determined that it meets the standards for adequate NEPA analysis under the CEQ NEPA regulations, and that it adequately assesses the environmental

effects of the cabin and corral construction. DOI met its public involvement requirements as discussed in Section 4.13 through circulation of this Draft Phase IV ERP/EA for public comment. Accordingly, DOI adopts the NPS EA. The entire NPS EA can be found in Appendix F.

13.2.4.6 Additional Environmental Analysis Included to Augment and Supplement the Adopted NPS EA

The DOI regulations provide that, when a bureau's proposed action differs from the proposed action contained in the adopted EA, the bureau may augment the adopted EA to make it consistent with the bureau's proposed action (see 43 C.F.R. § 46.320). The analysis presented below for this project component summarizes the relevant sections of the adopted NPS EA, and augments and supplements it. The analysis presented below considers all additional environmental consequences not analyzed in the adopted NPS EA that would result from the other elements of the presently proposed action. These other elements of the presently proposed action (those not already analyzed in the NPS EA) are referred to in this document as "enhanced nest detection activities," and include: increasing existing beach patrols, egg relocation and incubation under controlled conditions, and release of hatchlings to the Gulf of Mexico.

As stated above under "Construction and Installation", the expansion of the existing incubation facility at PAIS was also analyzed in the adopted NPS EA; however, expansion of that facility is not part of this proposed project component, and is not included in the analysis below.

In summary, DOI adopts the 2011 NPS EA for the cabin and corral construction. DOI is also providing supplemental analysis for the addition of the enhanced nest detection activities proposed in this project component.

13.2.5 Kemp's Ridley Sea Turtle Nest Detection and Enhancement Affected Environment and Environmental Consequences

The following sections describe the affected environment for each resource area or issue analyzed. The environmental consequences discussions summarize the NPS EA findings and analyze the potential impacts from the enhanced nest detection activities. The environmental consequences impacts of the nest detection activities alone and in combination with the cabin and corral construction are described, using the intensity level definitions for minor, moderate and major found in each section of resources and issues analyzed in the NPS EA (Appendix F).

13.2.5.1 Introduction and Background

The existing Program in Texas and Mexico has been reviewed and has been authorized under Section 10(a)(1)(A) of the ESA via Permits for Scientific Purposes, Enhancement of Propagation or Survival. Permits and agreements between the U.S. and Mexico have been in place for more than 20 years allowing nest detection activities there. The nest detection activities in Mexico are similar to those in Texas and would cause similar impacts as described below for relevant resource areas.

This section tiers from and incorporates by reference the relevant parts of Chapters 1, 2, 3 and 4 of the Final Phase III ERP/PEIS for background and information. The programmatic analysis in the Final Phase III ERP/PEIS looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project component. To avoid redundant or unnecessary information, resource areas that are not expected to be impacted are not evaluated further.

In cases where the resource area or issue is analyzed in the Final Phase III ERP/PEIS adequately without need for further analysis, the discussion from the Final Phase III ERP/PEIS is referenced and summarized.

Each element of the proposed project component, "cabin and corral construction" and "enhanced nest detection activities", is discussed separately, and in combination in each section.

13.2.5.2 Resources and Issues Considered and Not Analyzed in Detail

According to the CEQ Regulations for Implementing NEPA (Section 1502.1 and 1502.2) agencies should "focus on significant environmental issues" and for other than significant issues there should be "only enough discussion to show why more study is not warranted." After preliminary investigation, some resource areas were determined to be either unaffected or minimally affected by the proposed action.

These resources are not discussed in further detail below. Only those resource areas with potential, adverse impacts are discussed in detail below.

The programmatic analysis looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with the potential to be affected by the proposed project. To avoid redundant or unnecessary information, resources that are not expected to be affected are simply not evaluated further under a given project. Resource areas not analyzed in detail are listed below with a brief rationale for non-inclusion:

- Socioeconomics - Project spending for construction could benefit the local economy, but would be temporary, and the contribution to the local economy, overall, would be very small. The NPS EA states "Implementation of the proposed action could provide a negligible beneficial impact to the economies of nearby Corpus Christi, Texas, as well Nueces County due to minimal increases in employment opportunities for sea turtle patrollers and revenues for local businesses and governments generated from these additional construction activities and materials obtained. Any increase in workforce and revenue, however, would be temporary and negligible, lasting only as long as construction". Because the impacts to the socioeconomic environment would be negligible as described by NPS, the topic was dismissed from the NPS EA. This would hold true even in combination with the enhanced nest detection activities.
- Environmental Justice - The NPS EA states "Executive Order 12898 *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing

disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Because the new patrol cabins would be available for use by all staff of the park's Division of Sea Turtle Science and Recovery regardless of race or income, and the construction material would not be purchased based on the suppliers race or income, the proposed action would not have disproportionate health or environmental effects on minorities or low-income populations or communities. Because there would be no disproportionate effects, this topic is dismissed from further analysis in this document". This would hold true even in combination with the enhanced nest detection activities.

Impact topics (resource areas/issues) that were analyzed in detail in the adopted NPS EA for construction of the two cabins and corrals are: topography, geology and soils; special status species; visitor use and experience; park operations and floodplains. Other impact topics were dismissed from further detailed analysis because "they were not affected at all, or the effects were minor or less in degree, and would not result in any unacceptable impacts" (NPS EA).

13.2.5.3 Physical Environment

This section includes geology and substrates, air quality and greenhouse gas emissions, and noise. See Chapter 3 of the Final Phase III ERP/PEIS for detailed information on the physical environment of the region.

13.2.5.3.1 Geology and Substrates

Affected Environment

The proposed construction of the two new sea turtle patrol cabins would be on the Gulf of Mexico beachfront, set within its fore-dune ridge. The dunes of the National Seashore are significant topographic/geologic features. The enhanced nest detection activities could take place anywhere along the beaches where sea turtles nest in Texas and the state of Tamaulipas, Mexico.

Environmental Consequences

No Action

Under the no action alternative there would be no increased impacts to geology and substrates. Cabin construction would not occur and nest detection activities would remain the same as currently conducted, therefore no new impacts would occur.

Proposed Actions

- Cabin and corral construction
  The NPS EA states "Minor modifications of the topography would be required to provide a level surface on which to construct the cabins, which would have a negligible to minor effect to the topography of this area. The construction for the cabins would also require excavation, which

would displace and disturb soils, primarily in the footprint of the new cabins. Soils may also be disturbed and compacted on a temporary basis in the locations were the park would stage construction materials. There are significant topographic or geologic features in the project areas, and the proposed actions would result in negligible to minor, and temporary and permanent adverse effects to topography, geology, and soils."

Placement and construction of new cabins would require access through dunes, which could result in minor, direct, adverse effects. Any impacts or loss of dune features would be reestablished by re-contouring and through natural processes.

- Enhanced nest detection activities
  Section 6.3.9.1 of the Final Phase III ERP/PEIS states "Nest relocations could have a short-term minor impact to affected substrates but excavated sites would be backfilled immediately after the removal of turtle eggs." The use of Utility Terrain Vehicles (UTVs) on the beach and in the dune areas to transport staff during patrols could have short-term minor impacts on dunes. Staff are educated and trained to minimize damage to dunes as much as possible through avoidance of vegetated areas.

In combination, these two elements would have minor temporary and minor long-term impacts to geology and substrates. Best Management Practices (BMPs) such as avoidance of vegetated areas would minimize impacts.

13.2.5.3.2 Hydrology and Water Resources

Affected Environment

The proposed turtle patrol cabin project areas are located along the Gulf of Mexico shoreline; therefore, navigable waters and floodplains are present.

Environmental Consequences

No Action

Under the No Action alternative there would be no increased impacts to hydrology or water resources in the project area. Cabin construction would not occur and nest detection activities would remain the same as currently conducted, therefore no new impacts would occur.

Proposed Actions

- Cabin and corral construction
  The project is not expected to significantly affect water quality in the vicinity of the project area. The size of the two new patrol cabins' footprints (approximately 2,500 square feet each) would increase the amount of impervious surface in the area, which could possibly increase the erosion potential of the areas; however, the building would be elevated on piers and run off from the roofs would be able to infiltrate under the buildings and as these areas occur within

the intertidal zone, these effects are thought to be minimal. To further minimize water quality impacts resulting from erosion caused by construction-related activities, disturbed areas would be re-vegetated and re-contoured following construction. There is no septic system planned for the cabins, sewage would be collected using composting toilets. All waste and trash would be trucked away and disposed of in accordance with all local, state and federal laws and regulations.

Although the proposed project would occur on coastal beaches and intertidal areas, cabins and corrals would not be sited in vegetated wetlands. Any potential impacts to vegetated wetlands resulting from construction-related activities would be avoided and minimized to the maximum extent practicable.

Most of PAIS and all of the cabin construction area lie within the 100-year floodplain for the Gulf of Mexico and the Laguna Madre. The exception is the higher fore-dune areas located along the Gulf beach shoreline. The park provided a draft floodplains statement of findings to the various state and federal agencies required by the NPS's Director's Order and Procedural Manual #77-2: Floodplain Management. See page 48 of the NPS EA (Appendix F) for more information on impacts to floodplains.

- Enhanced nest detection activities
  The use of UTVs on the beach to transport staff during patrols could have short-term minor impacts on water resources depending on the areas traversed.

In combination, these two elements would not impact hydrology or water resources more than minimally; therefore the proposed project component would not adversely impact hydrology or water resources.

13.2.5.3.3 Air Quality and Greenhouse Gas Emissions

Affected Environment

The Clean Air Act (CAA) has established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare, including ecosystems, from air pollution. The NAAQS establish threshold concentrations for six 'criteria pollutants': nitrogen dioxide, sulfur dioxide, particulate matter (PM_{10} & $PM_{2.5}$), carbon monoxide, surficial ozone (O_3), and lead. The Gulf of Mexico air quality can be described by comparing measured, ambient air concentrations of these criteria pollutants for each of the Gulf States to the NAAQS. The proposed project component includes the beaches in Texas and Mexico. All of the Texas Gulf Coast counties meet the NAAQS for nitrogen dioxide, sulfur dioxide, carbon monoxide, particulate matter, and lead. However, the Houston-Galveston-Brazoria area has been listed by EPA as nonattainment for existing ozone standards (EPA 2013).

Environmental Consequences

No Action

Under the No Action alternative there would be no increased impacts to air quality or GHG levels in the project area. Cabin construction would not occur and nest detection activities would remain the same as currently conducted, therefore no new impacts would occur.

Proposed Actions

- Cabin and corral construction
  Section 6.3.9.3 of the Final Phase III ERP/PEIS states "During restoration activities, there could be short-term minor to moderate adverse impacts to air quality from emissions generated by construction equipment and vehicles." The NPS EA concluded that air quality and GHG effects would be minor or less in degree, and would not result in any unacceptable impacts. Rationale included the following: Constructing the new patrol cabins would require vehicles to deliver construction materials, and transport construction personnel to the proposed construction sites. These activities could result in temporary increases in air quality emissions whenever construction vehicles are operated. However, vehicle emissions would dissipate quickly due to prevailing southeast winds from March through September and north-northeasterly winds from October through February (PAIS 2000b as cited in NPS 2011). To reduce emissions, construction equipment would not be permitted to idle for long periods of time. Transport emissions would also be mitigated by providing temporary housing at the construction location, minimizing the number of trips to and from the job sites. Based on the estimated emissions per vehicle from Table 1 in the NPS EA, the number of vehicles operating in the park yearly, and the dominant daily winds, impacts to air quality would be negligible and within state and federal standards. The Class II air quality designation for Padre Island National Seashore would not be affected by the proposal. Further, because the Class II air quality would not be affected, there would be no unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006.

- Enhanced nest detection activities
  Use of UTVs to transport staff along the beaches during their patrol activities would not substantially create fugitive dust or increase regional levels of GHG. This project component element would potentially only minimally affect air quality and GHG emissions along the coastline of Texas and the state of Tamaulipas, Mexico.

In combination, qualitative analysis suggests these two elements would not impact air quality or GHGs more than minimally; therefore the proposed project component would not adversely impact air quality or GHG emissions. The use of gasoline and diesel-powered construction vehicles and equipment, including trucks, dozers etc., would contribute to an increase in GHG emissions. Although it is difficult to develop an accurate estimation of total fuel consumption associated with construction vehicle and equipment operation, the assumptions presented in Final Phase III ERP/PEIS project Chapters 8 through

12 for air emissions from construction activities serve as useful guidelines for estimating the levels of GHG emissions for the Kemp's ridley Nest Detection and Enhancement project component. The same types of equipment and length of use for similar analyses in the Final Phase III ERP/PEIS did not come close to the reference point of 25,000 metric tons of CO_2 emissions requiring a quantitative analysis.

13.2.5.3.4 Noise

Affected Environment

Section 3.2.4 of the Final Phase III ERP/PEIS states the primary sources of terrestrial noise in the coastal environment are transportation and construction-related activities. The primary sources of ambient (background) noise in the project area are humans and natural sounds such as wind and wildlife. The levels of noise in the project area varies, depending on the season, and/or the time of day, the number and types of sources of noise, and distance from the sources of noise. Noise-sensitive land users in the project area include visitors to the beaches. The NPS EA states that the proposed location for the two new patrol cabins and all construction activity would occur in a zone of the park that is currently accessible by park visitors and their vehicles. The dominant sound source is the crashing of the surf, other sounds in this area are most often generated from vehicular traffic (visitors and employees entering/leaving the National Seashore), people, boats, nonfederal oil and gas exploration and development, grounds-keeping equipment, climate controls equipment on the buildings, some wildlife such as birds, and wind. Sound generated by the long-term operation of the patrol cabins may include people using the building and vehicles coming and going.

Environmental Consequences

No Action

Under the No Action alternative there would be no increase to current noise levels in the project area. Cabin construction activities would not occur and nest detection activities would remain the same as currently conducted, therefore no new impacts would occur.

Proposed Actions

- Cabin and corral construction
  Noise effects would be minor or less in degree, and would not result in any unacceptable impacts, so were not analyzed in detail in the 2011 NPS EA. The NPS EA states "During construction, human-caused sounds would likely increase due to construction activities, equipment, vehicular traffic, and construction crews. Any sounds generated from construction would be temporary, lasting only as long as the construction activity is generating the sounds, and would have a negligible to minor adverse impact on visitors and employees. Further, such negligible or minor impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006."

- Enhanced nest detection activities
  This project component element would minimally affect the noise levels in the project area. Noise from the use of UTVs and other vehicles would be short-term and temporary and would not significantly add to the ambient noise.

In combination, these two elements would not impact noise levels more than minimally; therefore the proposed project component would not adversely impact noise levels.

13.2.5.4 Biological Environment

The northern Gulf of Mexico contains a range of habitats that support diverse and productive ecosystems with both nursery and feeding grounds for ecologically and economically important species (GCERTF 2011). These habitats and species are connected through the movement of organisms (population and genetic connectivity) and the exchange of nutrients and organic matter (horizontally from nearshore to offshore, and vertically from the surface waters to the ocean floor). These habitats shelter 97% of all fish and shellfish harvested from the region during spawning or other parts of their life cycle (NOAA 2010). Habitats, resources, and their ecological connection are all part of the biological environment of the northern Gulf of Mexico. See Chapter 3 of the Final Phase III ERP/PEIS for detailed information on the biological environment of the region. The biological environment is divided into two main sections: living coastal and marine resources, and protected species.

13.2.5.4.1 Living Coastal and Marine Resources

Affected Environment

Wildlife

Mammals commonly found along the Texas coast, include white-tailed deer, coyote, bobcat, badger, black-tailed jackrabbit, pocket gopher, raccoon, ground squirrel, kangaroo rat, mice, and bats. There have been 385 species of birds documented within PAIS alone. Many of these birds are found at the proposed locations for this project component; however, there are no known nesting sites or vital foraging and roosting grounds within the proposed locations, see attached NPS EA and Final Phase III ERP/PEIS Chapter 3 for more detail.

Vegetation

The project areas are located on the Gulf of Mexico, Texas shoreline within the Gulf dunes. These areas are made up of two rows of fore-dunes adjacent to the Gulf beach and high dune fields with scattered upland swales. The two rows of fore-dunes are typically dominated by silver-leaf croton (*Croton punctatus*), beach morning-glory (*Ipomoea pescaprae*), camphorweed (*Heterotheca subaxillaris*), prairie clover (*Dalea* sp.), western ragweed (*Ambrosia psilostachya*), and sea oats (*Uniola paniculata*). The high dune fields are generally dominated by camphorweed, Prairie clover, sea oats, seacoast bluestem (*Schizachyrium scoparium*), western ragweed (*Ambrosia psilostachya*), and some tropic croton (*Croton glandulosus* var. *lindheimeri*), see attached NPS EA and Final Phase III ERP/PEIS Chapter 3 for more detail.

Environmental Consequences

No Action

Under the No Action alternative there would be no increased impacts to living coastal and marine resources. Cabin construction would not occur and nest detection activities would remain the same as currently conducted, therefore no new impacts would occur.

Proposed Actions

- Cabin and corral construction
  - Wildlife

    Construction-related noise and vehicles accessing the sites could potentially disturb migratory bird species, but these adverse impacts would be 1) temporary, lasting only as long as construction, and 2) negligible, because suitable habitat for migratory birds is found throughout the region.

    If this proposed project is carried forward, smaller wildlife such as rodents, reptiles, and amphibians and their habitat would be displaced or eliminated during construction of the new cabins. Disturbed areas would be re-vegetated and restored following construction, which would result in a negligible to minor adverse impact to the wildlife and wildlife habitat in the immediate area of construction. During construction noise would also increase, which may disturb wildlife in the general area. Construction-related noise would be temporary, and existing sound conditions would resume following construction activities. Therefore, the temporary noise from construction would have a negligible to minor adverse effect on wildlife.

  - Vegetation

    In the areas of construction where the proposed footprints of the new cabins are, vegetation would be displaced, disturbed, and/or compacted. Any disturbance, where appropriate, would involve re-contouring and restoring of dunes, which includes replanting of disturbed vegetation. Because the proposed construction would consist of being elevated on stilts, it is thought that disturbance to vegetation would be minor or negligible. In addition, a monitor would be onsite to identify any rare, protected species, i.e., Roughseed sea-purslane (*Sesuvium trianthemoides*).

- Enhanced nest detection activities

  The project component element could potentially only minimally affect wildlife and vegetation of the proposed project component area. Patrol personnel do not drive through sensitive vegetated areas or near sensitive wildlife when present.

In combination, these two elements would not impact land resources more than minimally, therefore the proposed project component would not adversely impact living coastal and marine resources.

13.2.5.4.2 Protected Species

Protected species and their habitats include ESA-listed species and designated critical habitats, which are regulated by the USFWS, the NMFS, or both. Protected species and habitat also include marine mammals protected under the Marine Mammal Protection Act, EFH protected under the MSFCMA, migratory birds protected under the MBTA and eagles protected under the BGEPA. The Kemp's ridley nesting project component would occur approximately 200 feet inland from the Gulf shoreline (mean high water), therefore no marine mammals or EFH as described by the Magnuson-Stevens Fishery Conservation and Management Act occur in the project area. Only those protected species (Endangered Species Act and Migratory Bird Treaty Act) with the potential to be impacted by the proposed project component are discussed below.

Affected Environment

Threatened and Endangered Species

Sea Turtles

As described in Section 3.3.2.6 of the Final Phase III ERP PEIS, there are five species of sea turtles found within the Gulf of Mexico, all of which are listed under the ESA. All five species are migratory with a wide geographic range which includes the northern Gulf of Mexico and nesting can occur on sandy beaches with suitable habitat conditions. Within the Gulf of Mexico, Kemp's ridley nesting primarily occurs along the southern Texas coast extending south along the coast of Tamaulipas, Mexico. Section 13.2.1.2 of this document summarizes the status of these five sea turtles in the Gulf of Mexico and a more detailed discussion of these five sea turtle species can be found in Appendix A.5 of the Final Phase III ERP/PEIS.

Birds

Whooping Crane, Piping Plover and Red Knot

Within the project area, the whooping crane (*Grus Americana*) winters in coastal marshes in Texas at Aransas; while the piping plover (*Charadrius melodus*) and red knot (*Calidris canutus rufa*) winter along the Gulf coast beaches. Whooping cranes were listed as endangered in 1967 and currently exist in the wild at 3 locations and in captivity at 12 sites (http://ecos.fws.gov/speciesProfile/profile/speciesProfile?spcode=B003). There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, and winters in coastal marshes in Texas at Aransas. The July 2010 total wild population was estimated at 383. There is a small captive-raised, non-migratory population in central Florida, and a small, introduced (starting in 2001) migratory population of individuals that migrate between Wisconsin and Florida. Critical habitat was designated for the Whooping crane in 1978 and along the Gulf Coast includes the wintering grounds on Aransas National Wildlife Refuge and vicinity, Texas. The following are the equivalent of PCEs for the wintering habitat: areas that provide (1) food (insects, crayfish, frogs, small fish, other small animals, some aquatic vegetation and some cereal crops in adjacent croplands) and water resources; (2) an open expanse for

nightly roosting including sand and gravel bars, shallow water in rivers and lakes; (3) little human interaction as "a human on foot can quickly put a crane to flight at distances over one-quarter of a mile" (USFWS 1978 a, b).

On January 10, 1986, the piping plover was listed as endangered in the Great Lakes watershed and threatened elsewhere within its range, including migratory routes outside of the Great Lakes watershed and wintering grounds (USFWS 1985). The Piping Plover is a migratory shorebird that breeds from Nova Scotia south to North Carolina and winters along the Gulf Coast from Florida to Mexico, along the Atlantic Coast from Florida to North Carolina, and in the Caribbean. They are found on sandy beaches, lakeshores, dunes, and often well above the water line (USFWS 1985).

Piping plover Critical Habitat (units TX 1-28) is found along the Texas coast where the nest detection surveys could occur. The cabin/corral construction is located near Critical Habitat Unit TX-3: Padre Island, subunit 3.

Primary Constituent Elements (PCEs) for piping plover critical habitat are: 1) Intertidal flats with sand or mud flats (or both) with no or sparse emergent vegetation. 2) Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers. Such sites may have debris, detritus, or microtopographic relief (less than 50 cm above substrate surface) offering refuge from high winds and cold weather. 3) Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas. 4) Washover areas are broad, unvegetated zones, with little or no topographic relief, that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action.

The red knot was listed as threatened throughout its range in 2014; however critical habitat has not been proposed or designated (USFWS 2014). The red knot is a migratory shore bird whose migration route extends from the Canadian arctic to the southernmost extent of South America. Breeding occurs within the central Canadian high arctic. Southward migration from arctic breeding areas begins in mid-July. The Gulf Coast is used as a wintering ground and as a stopover area for individuals migrating to South America to winter. Red knots are currently known to winter in four distinct coastal areas of the Western Hemisphere: the southeastern United States (mainly Florida and Georgia, with smaller numbers in South Carolina); the Gulf of Mexico coast of Texas; Maranhão in northern Brazil; and Tierra del Fuego (mainly Bahía Lomas in Chile and Bahía San Sebastián and Río Grande in Argentina with smaller numbers northwards along the coast of Patagonia). Habitats for the red knot vary across their vast migratory range (USFWS 2014). In the United States, the red knot is found principally in intertidal marine habitats, especially near coastal inlets, estuaries, and bays, or along restinga formations[4]. Wintering and migration habitats within the United States are used for resting and foraging.

[4] A restinga formation is an intertidal shelf typically formed of densely-packed dirt blown by strong, offshore winds.

Northern Aplomado Falcon

Northern aplomado falcon (*Falco femoralis septentrionalis*) was listed as endangered in 1986. This falcon is being re-introduced to the coastal savannahs along the Gulf of Mexico on the Coastal Bend and Lower Coast of Texas as well as in west Texas. This species breeds from Cameron to Calhoun County in the extreme southern portion of the Texas Gulf Coast; birds outside of this area are rare. The northern aplomado falcon is one of three subspecies of the aplomado falcon and the only subspecies recorded in the United States. The No critical habitat has been proposed or designated for this species.

Migratory Birds

Many species of birds spend all or a portion of their life cycle along the Gulf of Mexico using a variety of habitats at different stages. Major groups of birds that inhabit the northern Gulf of Mexico include waterfowl and other water-dependent species, pelagic seabirds, raptors, colonial waterbirds, marsh-dwelling birds, and passerines. These groups are discussed in Chapter 3 of the Final Phase IIIPEIS.

Additionally, shorebirds are generally restricted to coastline and inland water margins (e.g. beaches, mudflats, and shallow wetlands). The Gulf Coast contains some of the most important shorebird habitat in North America. Many of these species stop to rest and forage during migration flights or spend the winter in nearshore habitat along the Gulf Coast.

The northern Gulf Coast provides habitat for colonial ground- or beach-nesting shorebird species that breed on beaches, flats, dunes, bars, barrier islands, and similar nearshore habitats. Shorebirds that breed along the Gulf Coast include plovers, oystercatchers, willets, avocets, and stilts. The Kemp's ridley nest detection and enhancement project would be active during the breeding seasons of these species, to the extent that they overlap the nesting season of the Kemp's ridley sea turtle.

Environmental Consequences

No Action

No action would maintain the existing Kemp's ridley nest detection and protection framework, however support for the program is highly variable and the level of effort may not remain constant. Under the No Action alternative, the benefits to sea turtle restoration provided by the proposed action component would not occur. For other protected species, cabin construction would not occur and nest detection activities would remain the same as currently conducted, therefore no new impacts would occur.

Proposed Actions

Threatened and Endangered Species

See the NPS EA, Appendix F, for a more detailed analysis of the potential impacts to threatened and endangered species from the cabin construction element.

- Cabin and corral construction (Sea Turtles and Birds)
  The new cabins would provide many beneficial effects for each sea turtle species occurring within the PAIS. The cabin and corral construction was the subject of a January 19, 2011, Biological Opinion completed by the Corpus Christi, Texas Ecological Services Field Office (Service). In this consultation, the Service authorized take of Kemp's ridley (3 adults and 3 nests with eggs or hatchlings), loggerhead (1 adult and 1 nest with eggs or hatchlings), and green sea turtles (1 adult and 1 nest with eggs or hatchlings). On March 30, 2015 the Service issued an amendment to the January 19, 2011 Biological Opinion. This amendment: extended the construction timeline for the proposed project; reaffirmed the take authorized for Kemp's, loggerhead, and green sea turtles; reaffirmed the Service's concurrence that hawksbill, leatherback, Northern aplomado falcon, and piping plovers are not likely to be adversely affected by the proposed construction project; reaffirmed that no critical habitat would be adversely modified or destroyed by the proposed construction project because none is present; and provided concurrence that the proposed project is not likely to adversely affect the red knot.

  Although the proposed cabin and corral construction activities are not located directly within piping plover Critical Habitat, CH Unit TX-3 is near where construction would take place. Project activities would be conducted such that the PCEs of the unit would not be impacted and the Service concurred that no adverse modification or destruction of critical habitat would occur.

  Conservation measures for the sea turtles and piping plover are outlined in the NPS EA, Biological Opinion, and are summarized below. The amendment indicates the conservation measures for piping plover would avoid or minimize impacts to the red knot. Because the PAIS cabin and corrals element of the proposed project component is valid and current, consultation will only occur if re-initiation triggers outlined in the Biological Opinion are met.

  Mitigation (conservation) measures for the proposed cabin construction to offset adverse effects would be simple, including measures to ensure that (1) fewer miles are driven along the Gulf beach, by placing a travel trailer or tents on the construction site, thereby reducing access miles driven on the Gulf beach; (2) using trained sea turtle monitoring escorts to lead convoys for any large trucks or heavy equipment traversing the Gulf beach, (3) controlling noise and light, with construction activities to occur only between the time of 30 minutes prior to dawn and 30 minutes after dusk; and (4) stockpiling construction materials up and off the beach, thereby allowing for nesting sea turtles uninhibited access to the Gulf beach and dunes.

- Enhanced nest detection activities
  - Sea turtles: This element of the proposed action component would have minor to moderate beneficial effects for establishment of the Kemp's ridley sea turtle, as well as all five of the nesting sea turtle species on the National Seashore. This project component would include: sea turtle handling, data collection, and release of adult Kemp's ridley sea turtles; collection, transport, and incubation of Kemp's ridley eggs; and release of Kemp's ridley hatchlings.

Workers would follow existing procedures and would be utilizing their existing authorities to handle sea turtles for this project component. The movement and care of Kemp's and other sea turtle eggs and hatchlings is considered purposeful "take" under the ESA. As such, the existing program has been reviewed and has been authorized under Section 10(a)(1)(A) of the ESA via Permits for Scientific Purposes, Enhancement of Propagation or Survival. The proposed project will enhance the existing program by providing increased personnel for conducting training and educational activities, providing new equipment (including vehicles) and supplies to replace old or inadequate equipment and supplies. The additional personnel, equipment and supplies, and funding to Gladys Porter Zoo are expected to help increase the number of nests detected, eggs successfully transported and hatched. Though an increase in capture and handling of eggs (i.e., increased "take") is anticipated due to the proposed project, we do not anticipate that the authorized take of the Existing Program will be exceeded. However, if necessary, Section 10(a)(1)(A) permits may be amended through standard USFWS procedures to increase authorized "take" to allow for handling and capture of increased nests and eggs.

- Whooping crane, piping plover and red knot: Sea turtle nest detection could occur in critical habitat for piping plover or whooping crane. No critical habitat has been designated for red knot. As a permit condition, "All sea turtle nest detection and relocation methodologies and activities must be coordinated with and approved by the USFWS..." If necessary, the USFWS would provide avoidance and minimization measures for critical habitat during the required coordination to ensure no critical habitat would be adversely modified or destroyed by the proposed project component.

  Whooping cranes are not expected to be present during nest detection activities as they do not generally use the beach front habitats where the surveys occur. In addition, whooping cranes typically leave Aransas NWR by April and are generally not expected on the Gulf coast during the time period for the nest detection activities. Red knot and piping plover are also not expected to be present during nest detection activities as they would generally be migrating to or nesting on their breeding grounds between April and mid-July. If still present, individuals of these species would be foraging and resting. If any whooping cranes, piping plover, or red knots would still be in the area, staff would avoid them until they left the area of their own volition. If present, negligible effects could occur to these species while foraging or resting due to disturbance from vehicles while beach driving. Disturbance will be minimized because participants in the nest detection program drive carefully to avoid birds, sea turtles, and other wildlife on the beaches.

Migratory Birds

Impacts from both elements of the proposed project component, cabin and corral construction and nest detection activities are combined here for ease of reading as potential impacts are basically the same or are not applicable to one of the elements.

Activities would follow standard protocols to avoid take of migratory birds. Cabin and corral locations would be located in disturbed areas of the park such that known nesting sites and vital foraging and roosting grounds are avoided. Nearby foraging and roosting birds would mediate their own exposure (i.e., move to suitable habitats within normal daily behavior patterns) to construction noise and use of the cabins and corrals for sea turtle recovery actions. Participants in the nest detection program drive carefully to avoid birds, sea turtles, and other wildlife on the beaches and do not approach nesting birds. Foraging or roosting birds would mediate their own exposure (i.e., move to suitable habitats within normal daily behavior patterns) to human and vehicle presence. Effects on migratory birds would be transitory and minor.

In combination, the project component could have minor, temporary impacts on some protected species such as piping plover and red knot. The proposed project component would increase the ability for personnel to detect and relocate Kemp's ridley nests, incubate and hatch the eggs, and release hatchlings back into the Gulf of Mexico. This would increase their likelihood of growing to maturity and contribute to the propagation of future breeding years. Moderate long-term benefits are anticipated because of the future generation of living marine resources (i.e. sea turtles) and population growth that could occur as a result of increased survival of hatchlings and reproductive success of adult breeders. Project implementation is based on the enhancement of existing programs that are well established in the Gulf of Mexico.

Other protected species such as marine mammals, and terrestrial mammals are not expected to be impacted by this project component as personnel would be working on shore and handling Kemp's ridley sea turtles only; however, minor disturbances of other turtle species, nesting shorebirds or critical habitat for piping plover and red knot are possible.

Consultation and permitting under the ESA with USFWS has been completed for this project component. Appropriate recommendations have been incorporated into the proposed project.

13.2.5.5 Human Uses and Socioeconomics

In addition to the ecological significance of its natural resources, and the diversity of its habitats, the Gulf of Mexico ecosystem is also culturally and socioeconomically important to the people of the Gulf coast and the United States. This section includes discussions cultural resources, land and marine management, aesthetic and visual resources, tourism and recreation, infrastructure, and public health and safety concerns that are pertinent to Early Restoration.

13.2.5.5.1 Cultural Resources

Affected Resources

As described in the Chapter 3 of the Final Phase III ERP/PEIS, cultural resources refer to a range of traditional, archeological, and built assets. This may include historical properties in coastal communities or resources that are offshore including shipwrecks, archeological sites, structures, or districts. The proposed locations for the two new sea turtle patrol cabins were surveyed by a NPS archeologist on

April 8, 2010, and no archeological sites were identified in the immediate project area, further, the National Seashore consulted with the park's state historical preservation office (SHPO), Texas Historical Commission (THC), for concurrence with the park's negative findings for the NPS archeological survey included in the NPS EA (THC 2010 as cited in NPS 2011).

Environmental Consequences

No Action

Under the No Action alternative, there would be no adverse impact to cultural resources in the project area. Cabin construction and other ground disturbing activities would not occur and nest detection activities would remain the same as currently conducted, therefore no new impacts would occur.

Proposed Actions

- Cabin and corral construction
  The NPS EA concluded that no adverse impacts to cultural resources are expected from this element of the proposed action component. The NPS EA states "While the proposed project areas are not expected to contain archeological deposits, appropriate steps would be taken to protect any archeological resources that are inadvertently discovered during construction. Because the project would not disturb any known archeological sites, the effect of the project on archeological resources is expected to be negligible. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006."

  Because the effects are minor or less in degree and would not result in any unacceptable impacts, the topic was dismissed from further analysis in the NPS EA. The NPS EA has provisions for inadvertent discoveries and states "In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed. Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of any discovery and the National Seashore would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, *Post Review Discoveries*."

  The National Park Service would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging paleontological materials, archeological sites, or historic properties. Contractors and subcontractors would also be instructed on procedures to follow in case previously unknown paleontological or archeological resources are uncovered during construction.

- Enhanced nest detection activities
  Because the nest detection activities only involve driving UTVs and other vehicles in areas that have no restricted access to these types of vehicles, the nest detection activity element of the proposed action component would have no adverse impact on cultural resources.

In combination, these two elements would have no adverse impact on cultural resources. The National Historic Preservation Act of 1966 (NHPA) charges the federal government with protecting the cultural heritage and resources of the nation. A complete review of this project under Section 106 of the NHPA would be completed before this proposed project component would be implemented. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

13.2.5.5.2 Land and Marine Management

Affected Resources

Land and marine areas may be set aside for a variety of active and passive recreational purposes. Land may be managed for wildlife and habitat protection and conservation, and/or scenic, cultural, and historical values. Land management may be at the Federal, State, or local levels by private organizations. The Final Phase III ERP/PEIS, Figure 13-12, provides a map of public lands in the Gulf of Mexico Coastal States, including those in Texas.

Pursuant to the Coastal Zone Management Act of 1972, federal actions must be consistent with the federally approved coastal management programs for states where the activities would affect a coastal use or resource of the state. Because the Sea Turtle Early Restoration Project includes activities with reasonably forseeable effects on the coastal uses or resources in each of the Gulf states, the Federal Trustees submitted a consistency determination for this project to the Texas General Land Office, the Louisiana Office of Coastal Management, the Mississippi Department of Marine Resources, the Alabama Department of Environmental Management, and the Florida Department of Environmental Protection via letters on May 21, 2015. Between June 22 and July 10, 2015, each of these agencies responded concurring with that determination of consistency on behalf of its state. As noted in several of the state responses, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in each state, as may be applicable.

Environmental Consequences

No Action

Under the No Action alternative the benefits to land use management that the proposed action would provide would not be realized. No Action would have a minor to moderate, direct, adverse effect on park operations at PAIS. The existing sea turtle patrol cabin would continue to be used; therefore, the expansion of facilities, providing overnight accommodations for additional staff, would not occur. Backcountry patrollers would continue to work out of the current patrol cabin, located approximately at

the park's 39-mile mark. This location poses the inability to monitor for sea turtle nest efficiently by having the starting and ending points for the daily surveys in non-optimum locations, resulting in lost time, unnecessary fuel and maintenance expenses, and additional carbon emissions.

Proposed Actions

- Cabin and corral construction
  Section 6.4.4 of the Final Phase III ERP/PEIS states that these project types would have varying impacts on land and marine management, depending on the type of management or land ownership applicable to the project site. Most of these project types that would be implemented would have no impact to land and marine management, since projects would generally be consistent with the prevailing management plans and direction governing the use of the land and marine areas where the projects would take place.

  The Final Phase III ERP/PEIS also states that projects implemented at national, state and local parks, wildlife refuges, and wildlife management areas could have short-term minor to moderate adverse impacts to land and marine management. These impacts would be temporary, and would occur if activities such as creation or restoration of wetlands; beach re-nourishment; placement of erosion control and shoreline protection; or other projects requiring construction activities result in partial or full closure of these areas during construction. Impacts could include the interruption of park operations; furlough of park staff; assignment of staff to duties not normally associated with their jobs; interruption of interpretive programs; and similar impacts. In the long-term, projects implemented under the project type "Restore and Protect Sea Turtles" would have beneficial impacts on land and marine management at parks, wildlife refuges and wildlife management areas because these restoration activities would help park management, and staff, fulfill their obligations to manage these properties for the benefit of the environment and human enjoyment.

- Enhanced nest detection activities
  This element of the proposed project component would provide beneficial impacts to land management by helping managers and staff to fulfill the goals of sea turtle protection.

In combination, these two elements would not adversely impact land management, but rather enhance it through sea turtle protection.

Both the cabin and corral construction and the nest detection activities would take place within the Texas coastal zones. Pursuant to the Coastal Zone Management Act of 1972, federal actiions must be consistent with the federally approved coastal management programs for states where the activities would affect a coastal use or resource of the state. Because the Sea Turtle Early Restoration Project includes activities with reasonably forseeable effects on the coastal uses or resources in each of the Gulf states, the Federal Trustees submitted a consistency determination for this project to the Texas General Land Office, the Louisiana Office of Coastal Management, the Mississippi Department of Marine Resources, the Alabama Department of Environmental Management, and the Florida Department of

Environmental Protection via letters on May 21, 2015. Between June 22 and July 10, 2015, each of these agencies responded concurring with that determination of consistency on behalf of its state. As noted in several of the state responses, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in each state, as may be applicable.

13.2.5.5.3 Aesthetic and Visual Resources

Affected Environment

The NPS EA states "According to 2006 *Management Policies*, the enjoyment of park resources and values by people is part of the fundamental purpose of all park units" (NPS 2006). The National Park Service is committed to providing appropriate, high quality opportunities for visitors to enjoy the parks, and would maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of society. Further, the National Park Service would provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks. The NPS Service 2006 *Management Policies* also state that scenic views and visual resources are considered highly valued associated characteristics that the National Park Service should strive to protect (NPS 2006).

As also stated in the NPS EA "The primary visitor activity is recreating on the beach, which may include beachcombing, fishing, bird watching, relaxing, and windsurfing; however, due to the extreme difficulty of access, only a few of the National Seashore's 600,000+ annual visitors travel into the park's backcountry beach, found along the Gulf of Mexico at the south end of the park."

Aesthetics and visual resources in the rest of the project component area are very similar to those in the PAIS.

The proposed patrol cabins would be located near the 30-mile mark and 50-mile mark locations; areas that are frequented by our down-island, backcountry beach visitors. The turtle patrol cabins would be set back into the dune line and only visible to visitors while passing directly in front the buildings. Because the proposed project would visually reconfigure the area in the two proposed places on the beach, the topic of visitor use and experience has been carried forward for further analysis (NPS 2011).

Environmental Consequences

No Action

Under the No Action alternative there would be no increased impacts to aesthetic and visual in the project area. Cabin construction would not occur therefore no structures would be located on the beach. Current nest detection activities have no impact on aesthetic and visual resources as the use of UTVs and other vehicles in the area is common.

Proposed Actions

- Cabin and corral construction

Although this project is consistent with the Protect Type “Restore and Protect Sea Turtles” in the Final Phase III ERP/PEIS, the impacts from construction of new facilities are better described under project type "Improve access to natural resources for recreational use through the construction or enhancement of infrastructure" which describes impacts from construction infrastructure, for example "enhancing or constructing infrastructure (e.g., boat ramps, piers, boardwalks, dune crossovers, camp sites or other lodging)."

The Final Phase III ERP/PEIS states that the project type “would have minor to moderate short-term adverse impacts from the temporary landscape during the construction period from the presence of bulldozers, front-loaders and other large earth moving equipment required for upgrades or new facilities.” These impacts would constitute a change in the viewshed that is readily apparent and which would attract attention in the short-term. Although such changes would not dominate the viewscape, they could detract from the current user activities or experiences. Over the long-term, the addition of infrastructure and facilities into the existing setting would present some degree of visual contrast. Long-term adverse effects of these enhancements would range from minor to moderate, depending on the existing aesthetic character of the surrounding landscape. Where the addition of these facility enhancements into the existing setting would present a large degree of visual contrast, impacts would be moderate because they would detract from the current user activities or experiences”.

The proposed patrol cabins would be located near the 30-mile mark and 50-mile mark locations; areas that are frequented by our down-island, backcountry beach visitors. The turtle patrol cabins would be set back into the dune line and only visible to visitors while passing directly in front the buildings. The proposed project would visually reconfigure the area in the two proposed places on the beach.

The NPS EA concludes that minor, direct, adverse effects resulting from changes to the view shed, would occur. The impact to the viewshed is expected to be long-term, lasting the duration of the cabins’ presence.

- Enhanced nest detection activities
  This element of the proposed project component would have no effect on the viewshed or aesthetics of the project area as only enhanced patrols would take place.

In combination, the proposed project elements impacts would be the same as for the cabin and corral construction element.

13.2.5.5.4 Tourism and Recreation

Affected Environment

Many tourism and recreational opportunities are centered on or around the northern Gulf of Mexico, and are therefore dependent on a clean, healthy Gulf ecosystem. Outdoor recreation, broadly defined,

is any leisure time activity conducted outdoors for pleasure or sport, including activities from wilderness camping to watching outdoor performances. The Final Phase III ERP/PEIS, Section 3.4, describes examples of recreational pursuits in the region, including onshore and offshore wildlife observation, hunting, beach and other waterfront use, boating, and recreational fishing.

Environmental Consequences

No Action

Under the No Action alternative, no impacts to tourism and recreation would occur. Cabin construction would not occur and nest detection activities would remain the same as currently conducted, therefore no new impacts would occur.

Proposed Actions

- Cabin and corral construction
  Minor, short-term adverse impacts to tourism and recreation could occur during the construction phase of the cabins. Construction activities would be scheduled to minimize construction-related impacts upon visitors. Areas not under construction would remain accessible to visitors as much as is safely possible. Employees and construction crews would be required to park their vehicles on the beach, away from the flow of beach driving traffic to ensure enough capacity and access to the National Seashore for visitors.

- Enhanced nest detection activities
  This element of the proposed action component would have no impact on tourism and recreation as only enhanced patrols would take place and no new infrastructure would be built on the beach.

In combination, the impacts would be the same as for cabin construction alone.

13.2.5.5.5 Infrastructure

Affected Environment

This proposed action would restore the sea turtle program's original two cabins, which were destroyed by Hurricane Bret in 1999 and meet the needs created by the success of the Turtle protection and restoration program (NPS EA Appendix F, page 22).

Environmental Consequences

No Action

Under the No Action alternative, the two new sea turtle patrol cabins and corrals would not be constructed. The existing sea turtle patrol cabin at the park's 39-mile mark would continue to provide biological technicians overnight accommodations and other support functions. The current cabin with accommodations for six would remain in its present condition, and the PAIS Division of Sea Turtle

Science and Recovery would not expand their backcountry patrol operations. The operation facilities would not be relocated and the efficiency and safety of the sea turtle recovery program would not be improved. The National Park Service would respond to future needs and conditions of the sea turtle recovery program as it does now, without major actions or changes than the present course of action (NPS EA Appendix F, page 22).

Proposed Actions

- Cabin and corral construction
  Two new sea turtle patrol cabins and corrals would be constructed, enhancing the infrastructure for the seat turtle nest detection and enhancement activities and providing benefits to the NPS sea turtle nest detection program.
- Enhanced nest detection activities
  No impacts to infrastructure would occur under this element of the proposed action component as only enhanced patrols would take place and no new infrastructure would be built.

In combination, these two elements would not adversely impact infrastructure and would have a minor, beneficial effect through the construction of safe, strategically located cabins and corrals.

13.2.5.5.6 Public Health and Safety

Affected Resources

Public health and safety issues relate to the short-term construction of projects and long-term operations and maintenance.

Environmental Consequences

No Action

As identified by a NPS advisory board, patrolling the backcountry beach for sea turtles carries risk for the sea turtle patroller. Accidents do occur when driving in the deep sand and uneven terrain of the Gulf beach at the National Seashore. Heat and fatigue are factors of working during the summer months in south Texas, and border related issues and criminal behavior can all pose threats to the backcountry sea turtle patrollers. Under the No Action alternative, the existing patrol cabin would continue to provide shelter and refuge from a dangerous event; however, this would be isolated to the current location of the cabin. In time, this could have a minor to moderate, direct, adverse effect on the employees and operations.

Proposed Actions

- Cabin and corral construction
  The proposed project would be conducted following all applicable occupational (OSHA) regulations and laws to ensure the safety of all workers, and protect members of the general public. Construction zones would be identified and fenced with construction tape, silt fencing, or some similar material prior to any construction activity. The fencing would define the

construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.

- Enhanced nest detection activities
  This element of the proposed project component would ensure that proper safety measures are followed when conducting beach patrols and translocating Kemp's ridley nests for incubation. No hazardous waste would be created due to the proposed action. In the event of a discharge of oil or release of hazardous substances, the release would be reported to the National Response Center (800-424-8802) and appropriate state agency as required. BMPs in accordance with Occupational Safety and Health Administration and state and local requirements would be incorporated into all activities. Personal protective equipment would be required for proper handling of sea turtles. The project component would not affect public health and safety in the Gulf of Mexico.

In combination these two elements could have short term minor adverse impacts to public safety during construction of the cabins. However, safety measures would be implemented to protect workers and the general public. Staff would be instructed to adhere to proper safety measures during beach patrols, especially for the operation of UTVs. Long-term minor to moderate beneficial impacts would occur from the cabin construction by providing shelter and security for the patrollers.

13.2.6 Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program

The location, scope, operations and maintenance, as well as affected environment and environmental consequences for Enhancement of the STSSN and Development of an Emergency Response Program project component are discussed in the following subsections.

Consultations and environmental reviews under the ESA, MSA, MMPA, MBTA, BGEPA, NHPA, and CZMA are required for this project component. Consultations and environmental reviews under the MSFCMA, MMPA and CZMA have been completed for this Phase IV plan.

To fulfill requirements and obligations under ESA, the Trustees initiated consultations pursuant to Section 7 of the ESA, as amended (16 U.S.C. 1531 et seq.) with the NMFS SERO's Protected Resources Division and the USFWS Texas Coastal Ecological Services Field Office.

The Trustees also reviewed the proposed project for impacts to bald eagles and migratory birds in accordance with the BGEPA and the MBTA and determined take would be avoided (DOI 2015). Refer to Phase IV ERP/EA Chapter 13, sections 13.2.5.4.2; 13.2.7.2.2; and 13.2.9.2.2.

Pursuant to Section 106 of the NHPA, a complete review of this project is ongoing to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Pursuant to the MSFCMA, NOAA and DOI reviewed the Sea Turtle Early Restoration Project for compliance with the MSFCMA, and had informational discussions with NMFS Southeast Regional Office (SERO's) Habitat Conservation Division (HCD) regarding Essential Fish Habitats (EFH). NOAA determined the project is not likely to adversely impact any EFH identified in the Gulf of Mexico Fishery Management Council's 2005 Generic EFH Amendment, or the NMFS Highly Migratory Species Fishery Management Plan. The SERO's HCD concurred with this and therefore concluded no consultation was required for the sea turtle project actions.

Pursuant to the MMPA, the Trustees have coordinated with NOAA SERO to determine that this project does not require authorization under the MMPA.

Pursuant to the CZMA, the Federal Trustees submitted a consistency determination for this project to the Texas General Land Office, the Louisiana Office of Coastal Management, the Mississippi Department of Marine Resources, the Alabama Department of Environmental Management, and the Florida Department of Environmental Protection via letters on May 21, 2015. Between June 22 and July 10, 2015, each of these agencies responded concurring with that determination of consistency on behalf of its state. As noted in several of the state responses, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in each state, as may be applicable.

13.2.6.1 Project Component Location

The proposed project component would be implemented throughout the Gulf of Mexico on land and in the nearshore coastal waters of each of the five states, Texas, Louisiana, Mississippi, Alabama, and Florida.

13.2.6.2 Project Component Scope

This project component would include 1) NOAA's enhancement of the Gulf of Mexico STSSN beyond current capacities for 10 years, 2) Texas Trustees' enhancement of the STSSN within Texas beyond current capacities for 10 years, and 3) NOAA's establishment a formal Sea Turtle Emergency Response Program within the Gulf of Mexico. This project component has the goal of improving response capabilities to quickly recover dead and injured sea turtles. The three elements of this project component are described below.

13.2.6.2.1 Enhancement of the Sea Turtle Stranding and Salvage Network

The STSSN was formally established in 1980 to collect information on and document strandings of sea turtles along the U.S. Gulf of Mexico and Atlantic coasts. Sea turtle strandings are defined as animals that either wash ashore or are found floating, dead or alive, and if alive, generally in a weakened condition. The STSSN includes federal, state and private partners, and is coordinated by NOAA. Each state has a STSSN coordinator, who coordinates stranding response within their state. The agencies that host the state coordinator for each state are; NPS for the Texas STSSN, Louisiana Department of Wildlife

and Fisheries for the Louisiana STSSN, NOAA for the Mississippi STSSN, USFWS for the Alabama STSSN, and Florida Fish and Wildlife Conservation Commission for the Florida STSSN.

Stranded turtles are documented on a standardized STSSN stranding form. Depending on species, size, location and carcass condition, dead stranded sea turtles are necropsied in the field, buried on the beach, or transported to freezer storage for later necropsy and sample collection. Live stranded turtles are transported to rehabilitation facilities or triaged in MASH units during cold stun events or emergency response incidents.

NOAA's Enhancement of the Gulf-Wide Sea Turtle Stranding and Salvage Network

NOAA would implement enhancements to the infrastructure of the Gulf of Mexico STSSN across all five states to enhance the capability for response, enhanced coordination, data handling and reporting, and streamlined data dissemination for use in conservation management programs. Participants in the Gulf-wide STSSN enhancement would include NOAA and the state STSSN coordinators for each of the five Gulf states. The enhancement would provide STSSN staffing positions across the Gulf-wide STSSN to improve response capabilities to recover dead or injured sea turtles and to handle and disseminate data for improved conservation management. The project would include funding for positions in each of the five states, and three new positions hired by NOAA to focus on Gulf-wide STSSN coordination. The intent of the enhanced STSSN is to provide a more rapid response to unusual stranding events, allowing mortality sources to be identified and addressed more rapidly and solutions to be implemented where possible. For example, if unusual strandings or increased stranding levels are observed in a particular area, and necropsies of those animals indicate forced submergence or fishery interactions to be the likely cause, then that information would be shared with the GMT and federal and state law enforcement agencies (i.e. TPWD Law Enforcement) to better direct where outreach and education and enforcement efforts could be focused.

Enhancement of the Sea Turtle Stranding and Salvage Network and Rehabilitation Efforts in Texas

DOI and the Texas Trustees would provide additional enhancement of the STSSN within Texas by providing funding to STSSN partner NGOs, universities, and rehabilitation providers to expand the capacity of the network. Stranded sea turtles in Texas are generally located during directed searches and as a result of reports from the public. Because much of the Texas coast is remote, difficult to access, and often requires a four-wheel drive vehicle or boat to retrieve stranded turtles, response times to stranded sea turtles can be lengthy. This proposed component would replace lost funding and expand the STSSN's capacity to find and rehabilitate injured and cold stunned turtles, with the goal of increasing the number of live sea turtles being returned to the Gulf, see Figure 13-7. Funding would go towards staffing, equipment, vehicles, and supplies. Participants supporting the proposed enhancement of the STSSN and rehabilitation efforts in Texas include NOAA, DOI, and TPWD as well as various NGOs, universities, and rehabilitation providers. NPS serves as the Texas state coordinator for the STSSN, with both state-wide and local responsibilities regarding sea turtle strandings on the Texas coast. NPS staff

members from PAIS provide training and technical assistance to STSSN participants in Texas and maintain the records of Texas sea turtle strandings.

13.2.6.2.2 Development of a Sea Turtle Emergency Response Program

This project component would provide funding for NOAA to develop and implement a comprehensive Sea Turtle Emergency Response Program in the Gulf of Mexico to increase the STSSN's capacity for response during emergency events, with the objective of increasing the survival of sea turtles during emergency events. A significant gap exists in STSSN preparedness for response to emergency events that could potentially kill and/or injure large numbers of sea turtles. This project component would have a primary focus of creating a formal plan and necessary infrastructure (i.e. supplies and equipment) and a robust training program to allow for rapid response to cold stun events that may kill or injure large numbers of sea turtles. These events require search and rescue operations, triage, treatment, temporary holding, and eventual release of turtles. Secondarily, the program would enhance capacity to respond to other emergency events such as hazardous weather events, oil spills, and harmful algal blooms. The program would work to increase response capacity by decreasing response times and increasing search areas during emergency events. Five MASH units and trailers would be purchased. Each contains twelve 500-gal tanks with filtration, UV filters, tents and setup equipment. This component would also include the use of contracts for vessel support during emergency events.

13.2.6.3 Construction and Installation

The project component does not require or include the construction of new facilities or infrastructure.

13.2.6.4 Operations, Maintenance, and Permitting/Authorization

The proposed project component would improve the infrastructure of the STSSN in the Gulf of Mexico, in all five states. The STSSN would operate under existing permit authorities (described below), using established protocols. STSSN Enhancement would be ongoing for 10 years. The project component would involve the purchase of MASH units and trailers, as well as vehicles, which would require maintenance. Equipment and vehicles would be used throughout the Gulf of Mexico to achieve the program goals.

The NMFS and USFWS share federal jurisdiction for the conservation and recovery of sea turtles. In accordance with the 1977 Memorandum of Understanding between NMFS and USFWS regarding roles and responsibilities for sea turtle conservation, protection and recovery, USFWS has lead responsibility on the nesting beaches and NMFS has lead responsibility in the marine environment. Sea turtle stranding response and rehabilitation has traditionally operated with a shared jurisdictional responsibility between the two agencies. NMFS has the primary coordination role to ensure that data are collected in a manner sufficient for management, monitoring, and research purposes and to facilitate its use to meet recovery objectives.

USFWS authorizes the state wildlife agencies of Texas, Louisiana, Mississippi, and Florida, to conduct on-land stranding response. The authorization is made under the Endangered Species Act Section 6

delegation authority. These agencies subsequently authorize stranding responders, working under the State Coordinator, to respond to and document stranded turtles. In Alabama, USFWS issues ESA Section 10(a)(1)(A) permits directly to stranding responders. USFWS also codified regulations (found at 50 C.F.R. §17.21 and 17.31) authorizing USFWS and NMFS personnel to respond to strandings on land. NMFS has codified regulations authorizing the STSSN (federal and state agencies, and their agents) to aid sick, injured, or dead sea turtles in the marine environment, found at 50 C.F.R. §222.310 (for endangered turtles) and 50 C.F.R. §223.206 (for threatened turtles).

The STSSN currently responds to and documents sick, injured and dead sea turtles that are found in coastal areas under U.S. jurisdiction. The project component would not change the types of activities the STSSN is conducting, but would provide additional resources to enhance the capacity of the program.

13.2.7 Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program Affected Environment and Environmental Consequences

The programmatic analysis in the Final Phase III ERP/PEIS looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project component focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resources that are not expected to be affected are not evaluated further under a given project component. After preliminary investigation, some resource areas were determined to be either unaffected or minimally affected by the proposed STSSN and Emergency Response Program actions. These resources are not discussed in further detail below. Only those resource areas with potential, adverse impacts are discussed in detail below.

Resource areas not analyzed in detail here for this project component include; geology and substrates, hydrology and water quality, aesthetics and visual resources, tourism and recreation, infrastructure, socioeconomics and environmental justice, land and marine management and shoreline protection. These resource areas are not expected to be affected by the STSSN or Emergency Response Program as they are either not connected or are very minimally connected physically, and/or are unrelated due to the nature of the project (i.e., program implementation versus a construction-related activity) and its two integrated actions.

13.2.7.1 Physical Environment

The Gulf of Mexico is the ninth largest body of water in the world and consists of the intertidal zone, continental shelf, continental slope, and abyssal plain. The nearshore coastal environment extends from estuarine waters seaward to the continental shelf edge of the Gulf of Mexico, including the coastline and the inner continental shelf at depths from 0 to 600 feet. The northern Gulf of Mexico is dominated by inputs from the Mississippi River Basin, which drains 41% of the contiguous United States and contributes 90% of the freshwater entering the Gulf (EPA 2011). Freshwater inflows to the Gulf provide nutrients and create hydrological conditions that create a wide range of ecosystems with unique features and habitats. The description of the physical environment of the Gulf of Mexico is divided into

geology and substrates, hydrology and water quality, air quality and greenhouse gas emissions, as well as noise characteristics of the area.

13.2.7.1.1 Air Quality and Greenhouse Gas Emissions

Affected Resources

The project area consists of the entire Gulf of Mexico, a maritime subtropical climate, as described in Chapter 3.2.3 of the Final Phase III ERP/PEIS and in Chapters 8-12 of the same document.

Environmental Consequences

No Action

No action would maintain the existing STSSN framework and would not develop an Emergency Response program. This alternative would not increase or decrease the quantity of stranding events that the existing STSSN would respond to.

Proposed Actions

Section 6.3.9.3 of the Final Phase III ERP/PEIS describes the impacts to air quality and greenhouse gas emissions from early restoration projects intended to restore and protect sea turtles including expansion of the sea turtle stranding network.

An expanded STSSN and developed Emergency Response program would increase the ability of personnel to respond to sea turtle stranding events and/or emergencies on water or land. A slight increase in the use of vessels and/or vehicles to respond to marine-based stranding events (e.g. cold stun event) or land based strandings may result in small, localized emission release as a result of vessel and/or vehicular use. The result of responding to an increased amount of stranding events may or may not result in minor, local, temporary air quality impacts. Any impact would only occur when vessels and/or vehicles are in use and existing conditions would prevail in the absence of their use.

13.2.7.1.2 Noise

Affected Resources

The project area consists of nearshore environments in the Gulf of Mexico as described in Chapter 3.2.4 of the Final Phase III ERP/PEIS. The primary sources of ambient (background) noise in the project area are natural sounds such as wind, wave action and wildlife. Very limited ambient noise is sources from humans or human activities. Those noises derived from humans include commercial and recreational vessels, marine transportation vessels or commercial platforms such as oil and gas rigs.

Environmental Consequences

No Action

No action would maintain the existing STSSN framework and would not develop an Emergency Response program. This alternative would not increase or decrease the quantity of stranding events that the existing STSSN would respond to and would have no effect on noise.

Proposed Actions

Section 6.3.9.4 of the Final Phase III ERP/PEIS describes the impacts to noise from early restoration projects intended to restore and protect sea turtles. Section 6.3.9.4 primarily discusses impacts based on construction activities. This project component would not include construction of new facilities or infrastructure of any kind.

An expanded STSSN and developed Emergency Response program would increase the ability for personnel to respond to sea turtle stranding events and/or emergencies on water or land. A slight increase in the use of vessels and/or vehicles to respond to marine-based stranding events (e.g. cold stun, oil spill, harmful algal bloom) or land based strandings may result. The minimal increase in vessel and vehicular use would have minor, short-term impacts on noise. Any impact would be minor, local and temporary, and only occur when vessels and/or vehicles are in use and existing conditions would prevail in the absence of their use.

13.2.7.2 Biological Environment

The northern Gulf of Mexico contains a range of habitats that support diverse and productive ecosystems with both nursery and feeding grounds for ecologically and economically important species (GCERTF 2011). These habitats and species are connected through the movement of organisms (population and genetic connectivity) and the exchange of nutrients and organic matter (horizontally from nearshore to offshore, and vertically from the surface waters to the ocean floor). These habitats shelter 97% of all fish and shellfish harvested from the region during spawning or other parts of their life cycle (NOAA 2010). Habitats, resources, and their ecological connection are all part of the biological environment of the Gulf of Mexico. The biological environment is divided into two sections: living coastal and marine resources and protected species. Protected species and their habitats include ESA-listed species and designated critical habitats, marine mammals, migratory birds, and EFH.

13.2.7.2.1 Living Coastal and Marine Resources

Affected Resources

This project component would be implemented on coastal areas including beaches and other shoreline habitats. As described in Chapter 3.3 of the Final Phase III ERP/PEIS, the Gulf of Mexico supports more than 15,000 combined marine and terrestrial species and includes many threatened and endangered species (NOAA 2011a). Detailed descriptions of the habitats and ecological communities found throughout the Gulf of Mexico can be found in Chapters 3.3.1 and 3.3.2 of the Final Phase III ERP/PEIS.

Environmental Consequences

No Action

No action would maintain the existing STSSN framework, however financial support for the program is highly variable and the level of effort might not remain constant. This alternative would not increase or decrease the quantity of stranding events that the existing STSSN would respond to and would have no additional effect on living coastal and marine resources.

Proposed Actions

Section 6.3.9.6 of the Final Phase III ERP/PEIS describes the impacts to living coastal and marine resources from early restoration projects intended to restore and protect sea turtle populations.

Human activity and/or the use of equipment, vessels, or vehicles could result in short-term minor adverse effects to beach habitats and coastal organisms.

13.2.7.2.2 Protected Species

Affected Resources

Protected species and their habitats include ESA-listed species and designated critical habitats, which are regulated by either the USFWS or the NMFS. Protected species and habitat also include marine mammals protected under the Marine Mammal Protection Act, EFH protected under the Magnuson-Stevens Fishery Conservation and Management Act, migratory birds protected under the Migratory Bird Treaty Act, and eagles protected under the Bald and Golden Eagle Protection Act.

Endangered Species

As described in Section 3.3.2.6 of the Final Phase III ERP PEIS, there are five species of sea turtles found within the Gulf of Mexico, all of which are listed under the ESA. All five species are migratory with a wide geographic range which includes the northern Gulf of Mexico and nesting can occur on any beach with suitable conditions. Section 13.2.1.2 summarizes the status of these five sea turtles in the Gulf of Mexico and a more detailed discussion of these five sea turtle species can be found in Appendix A.5 of the Final Phase III ERP/PEIS.

The proposed project component would include handling of sea turtles, data collection including measurements, tagging, transport, rehabilitation and release of live stranded sea turtles, or necropsy and sampling of dead stranded sea turtles. Responders would follow existing protocols for response to live and dead sea turtles, including transport, collection and necropsy protocols. The STSSN is currently authorized to handle sick, injured and dead sea turtles, and would be using their existing authorities to handle sea turtles for this project component.

Sections 3.3.2.8 (birds) and 3.3.2.9 (terrestrial wildlife) of the Final Phase III ERP/PEIS describe other species protected under the ESA that could occur in the project component area including terrestrial mammals. Further details can be found in Appendix 6 and Appendix 7 in the Final Phase III ERP/PEIS.

Essential Fish Habitat

The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. The habitat in the project component area includes the Gulf of Mexico waters and consists primarily of soft bottom and sandy substrate consistent with sediment along the northern Gulf of Mexico.

Marine Mammals

Marine mammals found within the Gulf of Mexico include 21 species of cetaceans (whales and dolphins) and the West Indian manatee. Six species of marine mammals in the Gulf are listed as threatened or endangered under the ESA, including the West Indian manatee, blue whale, finback whale, humpback whale, sei whale, and sperm whales.

A detailed discussion of protected marine mammals can be found in Section 3.3.2.7 of the Final Phase III ERP/PEIS.

Bald and Golden Eagles

Bald and golden eagles potentially forage within the project component location. A detailed discussion of protected Bald and Golden Eagles can be found in Section 3.3.2.7 of the Final Phase III ERP/PEIS.

Migratory Birds

Many species of birds spend all or a portion of their life cycle along the Gulf of Mexico using a variety of habitats at different stages. Major groups of birds that inhabit the northern Gulf of Mexico include waterfowl and other water-dependent species, pelagic seabirds, raptors, colonial waterbirds, marsh-dwelling birds, and passerines. These groups are discussed in Chapter 3 of the Final Phase III ERP/PEIS. A detailed discussion of protected Migratory birds can be found in Section 3.3.2.7 of the Final Phase III ERP/PEIS.

Environmental Consequences

No Action

No action would maintain the existing STSSN framework and would not develop an Emergency Response program. This alternative would not increase or decrease the quantity of stranding events that the existing STSSN would respond to and would have no additional effect on protected species.

Proposed Actions

Section 6.3.9.6, 6.7.6.1 and 6.7.6.2 of the Final Phase III ERP/PEIS describes the impacts to living coastal and marine resources from early restoration projects intended to restore and protect sea turtle populations.

An expanded STSSN and developed Emergency Response program would increase the ability of personnel to respond to sea turtle stranding events and/or emergencies on water or land. As described

in Section 6.3.9.6, 6.7.6.1 and 6.7.9.2 of the Final Phase III ERP/PEIS long-term benefits to sea turtles include increased response time, additional funding, responder training, and improved stranding response. The project component would work to aid stranded sea turtles but would not directly impact any threats to sea turtles in the marine environment. Faster response times and holding facilities (e.g. MASH units) would result in quicker responses with the goal of reducing the number of dead or euthanized sea turtles while providing additional data to improve future management decisions. The additional data obtained by the expanded STSSN and Emergency Response program would facilitate additional coordination not only throughout the STSSN network but also with NOAA's Gear Monitoring Teams, NOAA's Observer Program, and TPWD law enforcement. Moderate short-term benefits for sea turtles are anticipated due to increased survival or stranded turtles.

Negligible to minor, direct, adverse effects could occur to migratory birds, eagles, or marine mammals by disturbance from vehicles while beach driving or vessels on water; however, mitigation measures currently in place under the existing programs, such as providing information to workers on general awareness and means to avoid impacts to protected species and their habitats would minimize any potential impacts. In addition, activities would be conducted under the provisions of existing permits and authorities issued by the USFWS and NMFS. Effects on these species would be temporary, local, and minor.

13.2.7.3 Human Uses and Socioeconomics

In addition to the ecological significance of its natural resources, and the diversity of its habitats, the Gulf of Mexico ecosystem is also culturally and socioeconomically important to the people of the Gulf coast and the United States. This section includes discussions cultural resources, land and marine management, and public health and safety concerns that are pertinent to Early Restoration.

13.2.7.3.1 Cultural Resources

Affected Resources

As described in the Chapter 3.4.2 of the Final Phase III ERP/PEIS, cultural resources refer to a range of traditional, archeological, and built assets. This may include historical properties in coastal communities or resources that are offshore including shipwrecks, archeological sites, structures, districts or Native American resources protected by a U.S. laws and regulations. Land resources are included in this category because of the level of protection granted by federal, state, and/or local governments. The following are included in the project area: National Wildlife Refuges, National Parks, State Parks, State Wildlife Management Areas, City/County parks, land trusts and/or Marine Protected Resources, National Estuarine Research Reserve System, National Marine Sanctuaries.

Environmental Consequences

No Action

No action would maintain the existing STSSN framework and would not develop an Emergency Response program. This alternative would not increase or decrease the quantity of stranding events that the existing STSSN would respond to and would have no additional effect on cultural resources.

Proposed Actions

This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. An expanded STSSN and developed Emergency Response program would increase the ability for personnel to respond to sea turtle stranding events and/or emergencies on water or land. A slight increase in the use of vessels and/or vehicles to respond to marine-based stranding events (e.g. cold stun events) or land based strandings may result due to implementation of the proposed project component. Proposed actions are expected to adhere to all federal, states, and local regulations concerning the implementation of activities within or near cultural sensitive areas. A review of this project under Section 106 of the NHPA would be completed prior to project implementation.

13.2.7.3.2 Public Health and Safety

Affected Resources

Public health and safety issues relate to long-term program operations and maintenance of vehicles and equipment. This project component does not include construction.

The proposed project component would be conducted following all applicable occupational OSHA safety regulations and laws to ensure the safety for all workers, and protect members of the general public. Vehicles have regulations and laws that are enforced to ensure that proper mechanical and operational hazards are minimized to the extent practicable.

Environmental Consequences

No Action

No action would maintain the existing STSSN framework and would not develop an Emergency Response program. This alternative would have no effect on public health and safety.

Proposed Actions

The proposed action would ensure that proper safety measures are followed when responding to sea turtle strandings. No hazardous waste would be created due to the proposed action. In the event of a discharge of oil or release of hazardous substances, the release would be reported to the National Response Center (800-424-8802) and appropriate state agency as required. BMPs in accordance with OSHA, state, and local requirements would be incorporated into all activities. Personal protective

equipment would be required for proper handling of sea turtles. Any impact would be minor, local and temporary, and only occur when vessels and/or vehicles are in use.

13.2.8 Gulf of Mexico Shrimp Trawl Bycatch Reduction and Texas Enhanced Fisheries Bycatch Enforcement

The location, scope, operations and maintenance, as well as affected environment and environmental consequences for Gulf of Mexico Bycatch Reduction and Texas Enforcement proposed actions are discussed in the following subsections. Due to the expected overlap in the affected environment and environmental consequences, the following two project components were combined for this environmental assessment:

1. Gulf of Mexico Shrimp Trawl Bycatch Reduction
2. Texas Enhanced Fisheries Bycatch Enforcement

NOAA's Gulf of Mexico Shrimp Trawl Bycatch Reduction project component would include enhancement of two existing NOAA programs: the GMT program and the Observer Program.

Consultations and environmental reviews under the ESA, MSFCMA, MMPA, MBTA, BGEPA, NHPA, and CZMA are required for this project component. Consultations and environmental reviews under the MSFCMA, MMPA and CZMA have been completed for this Phase IV plan.

To fulfill requirements and obligations under ESA, the Trustees initiated consultations pursuant to Section 7 of the ESA, as amended (16 U.S.C. 1531 et seq.) with the NMFS SERO's Protected Resources Division and the USFWS Texas Coastal Ecological Services Field Office.

The Trustees also reviewed the proposed project for impacts to bald eagles and migratory birds in accordance with the BGEPA and the MBTA and determined take would be avoided (DOI 2015). Refer to Phase IV ERP/EA Chapter 13, sections 13.2.5.4.2; 13.2.7.2.2; and 13.2.9.2.2.

Pursuant to Section 106 of the NHPA, a complete review of this project is ongoing to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Pursuant to the MSFCMA, NOAA and DOI reviewed the Sea Turtle Early Restoration Project for compliance with the MSFCMA, and had informational discussions with NMFS Southeast Regional Office (SERO's) Habitat Conservation Division (HCD) regarding Essential Fish Habitats (EFH). NOAA determined the project is not likely to adversely impact any EFH identified in the Gulf of Mexico Fishery Management Council's 2005 Generic EFH Amendment, or the NMFS Highly Migratory Species Fishery Management Plan. The SERO's HCD concurred with this and therefore concluded no consultation was required for the sea turtle project actions.

Pursuant to the MMPA, the Trustees have coordinated with NOAA SERO to determine that this project does not require authorization under the MMPA.

Pursuant to the CZMA, the Federal Trustees submitted a consistency determination for this project to the Texas General Land Office, the Louisiana Office of Coastal Management, the Mississippi Department of Marine Resources, the Alabama Department of Environmental Management, and the Florida Department of Environmental Protection via letters on May 21, 2015. Between June 22 and July 10, 2015, each of these agencies responded concurring with that determination of consistency on behalf of its state. As noted in several of the state responses, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in each state, as may be applicable.

13.2.8.1 Project Component Locations

The proposed Gulf of Mexico Bycatch Reduction project component would be implemented throughout the Gulf of Mexico in both state and federal waters within areas or regions associated with shrimp trawl fisheries. The U.S. portion of the Gulf of Mexico extends from the southern tip of Texas eastward to the Florida Keys, following the coastline of five states including Texas, Louisiana, Mississippi, Alabama, and Florida. NOAA's enhanced GMT program would include marine-based activities associated with courtesy at-sea TED inspections and would also conduct minimal land-based activities such as conducting fisher education workshops, training events, and courtesy dock-side TED inspections. No environmental impacts are expected from these land-based activities and therefore they are not addressed in the environmental consequences. The Observer Program would include marine-based activities associated with conducting observations aboard existing active shrimp fishing vessels. Observers would be placed on randomly selected state-licensed and federally-licensed shrimp vessels to monitor for sea turtle bycatch.

The Texas Enhanced Fisheries Bycatch Enforcement component activities would occur in Texas State waters (approximately 367 miles of coast line out to 9 nautical miles) and the EEZ off Texas within the Gulf of Mexico.

13.2.8.2 Project Component Scope

The following subsections describe the scope of each project component.

13.2.8.2.1 Gulf of Mexico Shrimp Trawl Bycatch Reduction

The Gulf of Mexico Shrimp Trawl Bycatch Reduction project component would enhance two existing NOAA programs, the GMT and the Observer Program, described further below.

Gulf of Mexico Gear Monitoring Team Enhancement

This project component would expand NOAA's GMT program within the Gulf of Mexico. The primary goal of the proposed expanded GMT program is to increase capacity for education and outreach to the shrimp fishing community to improve compliance with existing federal TED regulations. The expanded GMT is intended to provide direct benefits to sea turtles by decreasing the likelihood of capture mortality through greater use of properly built, installed, and maintained TEDs.

A TED is a grid that fits into the cod end of the trawl, with a top or bottom escape opening covered with a flap. Sea turtles, and other animals such as sharks, encounter the TED grid when they pass through the trawl and are able to escape through the adjacent opening. Small animals, such as shrimp, pass through the bars of the TED and are caught in the cod end of the trawl. When installed properly, TEDs are expected to be 97% effective at releasing sea turtles from trawl gear.

NOAA's GMT program operates out of the Southeast Fisheries Science Center, Pascagoula Lab, and currently consists of one mobile team comprised of two individuals. This project component would add two new teams (each consisting of 2 staff), increasing the program to three teams total. The two new teams would be deployed throughout the Gulf of Mexico. The GMT would improve TED compliance by working closely with TED manufacturers and net shops to assist and ensure that TEDs are properly built and installed to the required standards. The GMT would work with the fishing industry to improve their knowledge and understanding of how to effectively build, use, and maintain TEDs. This would be achieved through offering workshops and courtesy dock-side and at-sea TED inspections.

The GMT would also work closely with the Observer Program and the STSSN to identify specific areas of bycatch concern within the Gulf. Through working with state agencies, the Observer Program, and the STSSN, the GMT would target under-represented areas in the Gulf and areas identified as potentially problematic for sea turtle bycatch. The project component is designed to enhance coordination with other State and Federal agencies, fishing industry and fishery associations (State and National). The proposed actions would provide additional support and resources that are needed to increase compliance with TED regulations.

Southeast Shrimp Trawl Fisheries Observer Program Enhancement

This project component would expand the capacity of NOAA's Observer Program to place trained observers on shrimping vessels in the Gulf of Mexico to monitor sea turtle bycatch. The Observer Program is operated out of the NMFS, Southeast Fisheries Science Center, Galveston Lab. The primary goal of the expanded Observer Program would be to improve capacity to collect data on bycatch of sea turtles in the shrimp trawl fishery in the Gulf. The funding for this project component would add 300 observer sea days annually for a 10-year period. This additional coverage would focus on specific times and areas identified as priorities for monitoring sea turtle bycatch to allow for better characterization and assessment of bycatch. Information on sea turtle interactions with fishing activities would help target, refine, and improve conservation management and potential recovery of sea turtles in the Gulf.

NOAA's Observer Program currently observes approximately 2% of the commercial shrimp trawl fleet in the Gulf of Mexico and Southeast U.S. Atlantic (approximately 1,500 sea days annually), at an annual cost of approximately $2 million (NMFS 2013, NMFS 2012). The additional information gained through this expansion would also be used to better inform the target areas for GMT efforts and the STSSN to improve conservation management and recovery of sea turtles in the Gulf of Mexico. The intent of the expansion of the Observer Program monitoring is to ultimately decrease the number of bycatch mortalities of Kemp's ridley, loggerhead, and green sea turtles in the shrimp trawl fishery in the Gulf of Mexico. The placement of observers would be reviewed by NOAA to ensure that observations are

occurring at the correct times and/or locations where sea turtles are likely to be present and where bycatch concerns are greatest.

13.2.8.2.2 Texas Enhanced Fisheries Bycatch Enforcement

Funds for the Texas Enhanced Fisheries Bycatch Enforcement project component would be used to enhance TPWD enforcement activities for fisheries that incidentally catch sea turtles while they operate primarily in Texas State waters (approximately 367 miles of coast line out to 9 nautical miles) and the EEZ off Texas within the Gulf of Mexico for a 10-year period. These increased enforcement operations would focus on compliance with TED regulations during the Gulf shrimp fishery season (primarily February through mid-May) right before the Gulf closes to shrimping in May. Patrols would be targeted during this timeframe because it is the beginning of the nesting season and an active time for shrimp fishing. Previous efforts to increase enforcement activities during this time period have had a positive impact on compliance rates, reducing the number of observed strandings during this time period. The primary goal of this project component is to reduce sea turtle mortalities through increased compliance with TED regulations as a result of increased enforcement actions.

The project component would include a series of patrols focusing on the enforcement of TED regulations in the Gulf of Mexico along the entire Texas coast ensuring compliance aboard commercial shrimp vessels. Targeted patrols would primarily occur during the period of the year when sea turtle strandings have historically been the highest. These patrols would be over and above the current patrol frequency in the Texas state waters of the Gulf of Mexico.

The vessels associated with this type of open sea enforcement activities are mid-range patrol vessels with a crew of three Game Wardens and long-range patrol vessels with a crew of four Game Wardens. There are thirteen mid-range patrol vessels and two long-range patrol vessels along the coast. TPWD expects to provide about 200 boat hours of mid-range patrol and boat 80 hours of long-range patrol to enhance enforcement of TEDs. Hours may be shifted between the types of vessel as weather or patrols demand.

13.2.8.3 Construction and Installation

None of the Gulf of Mexico Bycatch Reduction and Texas Enforcement project component activities, including associated land-based activities, require or include any construction activities.

13.2.8.4 Operations and Maintenance

The following subsections describe the operation and maintenance of each of two project components.

13.2.8.4.1 Gulf of Mexico Shrimp Trawl Fishery Bycatch Reduction

Gulf of Mexico Gear Monitoring Team Enhancement

NOAA's GMT Enhancement project component would provide funding to expand upon the existing GMT program currently operating throughout the Gulf of Mexico. The proposed project component would

provide a greater capacity for outreach to and education for the shrimp fishing community to improve compliance with existing Federal TED regulations. Enhanced operations would be ongoing for 10 years. GMT enhancement activities would include purchasing vehicles and vessels which would require periodic maintenance.

Southeast Shrimp Trawl Fisheries Observer Program Enhancement

The project component would provide funding to expand upon the existing Observer Program that is currently operating throughout the Gulf of Mexico within the shrimp trawl fishery. Observer Program enhancement would add 300 annual observer sea days for a period of 10 years. None of the Observer Program enhancement activities require or include maintenance of vehicles or other equipment.

The Observer Program is currently operating under scientific research permit file No. 15552 (NMFS 2011a), which was evaluated within an EA titled "Environmental Assessment on a Scientific Research Permit to the National Marine Fisheries Service Science Center (Permit File No. 15552) to conduct research on threatened and endangered sea turtles" (NMFS 2011b). The permit, issued by NMFS, authorizes research activities to be carried out by fishery observers on ESA-listed sea turtles incidentally captured in commercial fisheries. The purpose of the research is to document the take of ESA-listed sea turtles at multiple life stages in commercial fisheries and to enhance estimates of sea turtle bycatch in order to characterize the effects on sea turtle sub-populations (NOAA 2011). Research activities would include the handling of sea turtles for identification, photography, measuring, applying a Passive Integrated Transponder (PIT) tag, collecting a biopsy sample, and flipper tag sea turtles, salvage parts, and potential transportation of dead or injured turtles to approved STSSN personnel. The data collected by the observers would provide valuable information to target, refine, and improve conservation management and recovery of sea turtles in the Gulf of Mexico.

13.2.8.4.2 Texas Enhanced Fisheries Bycatch Enforcement

The Texas Enforcement project component would provide funding to enhance the existing bycatch enforcement activities conducted by TPWD. The project component would include a series of patrols focusing on the enforcement of TED regulations (Statewide Shrimp Fishery Proclamation at 31 TAC 58.160) in the Gulf of Mexico along the entire Texas coast ensuring compliance aboard commercial shrimp vessels. These patrols would be over and above the current patrol frequency in the Texas state waters or the Texas EEZ in of the Gulf of Mexico. Expanded operations would be ongoing for 10 years and would require maintenance of TPWD vessels. Gulf of Mexico Shrimp Trawl Bycatch Reduction and Texas Enhanced Fisheries Bycatch Enforcement Affected Environment and Environmental Consequences

The programmatic analysis in the Final Phase III ERP/PEIS looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project component focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resources that are not expected to be affected are not evaluated further under a given project component. After preliminary investigation, some resource areas were determined to be either unaffected or minimally affected by the proposed Gulf of Mexico Bycatch Reduction and Texas Enforcement actions. These resources are not discussed in

further detail below. Only those resource areas with potential, adverse impacts are discussed in detail below.

Resource areas not analyzed in detail here for this project component include; geology and substrates, hydrology and water quality, socioeconomics and environmental justice, land and marine management, aesthetics and visual resources, tourism and recreation, infrastructure, and shoreline protection. The affected environment for this project component is the biological and physical resources occurring within the watersheds of the Gulf of Mexico. More specifically, since the proposed project component would involve observation work on active shrimp trawl vessels, data collection on sea turtle species that are incidentally captured in shrimp trawls, and education or enforcement actions taken on active shrimp trawl vessels. For purposes of this analysis the affected environment focuses primarily on the biological resources occurring within these waters.

13.2.9 Gulf of Mexico Shrimp Trawl Bycatch Reduction and Texas Enhanced Fisheries Bycatch Enforcement Affected Environment and Environmental Consequences

13.2.9.1 Physical Environment

This section typically includes geology and substrates, hydrology and water quality, air quality and greenhouse gas emissions, and noise; however, only air quality and greenhouse emissions and noise are described below. See Chapter 3 of the Final Phase III ERP/PEIS for detailed information on the physical environment of the region involved with these project components.

13.2.9.1.1 Air Quality and Greenhouse Gas Emissions

Affected Resources

The project area consists of the entire Gulf of Mexico, a maritime subtropical climate, as described in Chapter 3.2.3 of the Final Phase III ERP/PEIS.

The project component activities would primarily be conducted in the Gulf of Mexico aboard Texas patrol and fishing vessels in zones of the Gulf of Mexico commonly used by the shrimp fishery industry of the U.S.

Environmental Consequences

No Action

No action would maintain the existing level of effort for the Observer Program, GMT, and Texas Enforcement activities within the Gulf of Mexico, and programs would not be enhanced or expanded.

Proposed Actions

Section 6.3.9.3 of the Final Phase III ERP/PEIS describes the impacts to air quality and greenhouse gas emissions from early restoration projects intended to restore and protect sea turtles including expanding bycatch reduction programs.

Expanded Observer Program, GMT, and Texas Enforcement activities would lead to a slight increase in the use of vessels and may result in small, localized emission release as a result of vessel use. The result of the proposed action would result in minor, local, temporary air quality impacts. Any impact would only occur when vessels are in use and existing conditions would prevail in the absence of their use.

13.2.9.1.2 Noise

Affected Resources

The project area consists of nearshore and offshore marine environments in the Gulf of Mexico as described in Chapter 3.2.4 of the Final Phase III ERP/PEIS. The primary sources of ambient (background) noise in the project area are natural sounds such as wind, wave action and wildlife. Very limited ambient noise is sources from humans or human activities. Those noises derived from humans include commercial and recreational vessels, marine transportation vessels or commercial platforms such as oil and gas rigs. In the offshore area, these sources are widely dispersed over broad geographic space.

Noise from vessel operations can travel below and above the surface of the water. Additional noise would be created by limited vehicular and vessel use.

Environmental Consequences

No Action

No action would maintain the existing level of effort for the GMT, Observer Program, and Texas Enforcement activities within the Gulf of Mexico, and programs would not be enhanced or expanded.

Proposed Actions

Section 6.3.9.4 of the Final Phase III ERP/PEIS describes the impacts to noise from early restoration projects intended to restore and protect sea turtles. Section 6.3.9.4 primarily discusses impacts based on construction activities. This project component would not include any construction activities.

Implementation of the project components would include noise from two additional vehicles and vessels in the GMT program and additional boat hours from TPWD enforcement vessels. These impacts would be minor, localized, and in short duration. Once the vessels complete their operations, the noise level returns to ambient levels and any short-term or long-term impact is therefore deemed minor.

13.2.9.2 Biological Environment

The northern Gulf of Mexico contains a range of habitats that support diverse and productive ecosystems with both nursery and feeding grounds for ecologically and economically important species (GCERTF 2011). These habitats and species are connected through the movement of organisms (population and genetic connectivity) and the exchange of nutrients and organic matter. These habitats shelter 97% of all fish and shellfish harvested from the region during spawning or other parts of their life cycle (NOAA 2010). Habitats, resources, and their ecological connection are all part of the biological environment of the Gulf of Mexico. The biological environment is divided into two sections: living

coastal and marine resources and protected species. Protected species and their habitats include ESA-listed species and designated critical habitats, marine mammals, migratory birds, and EFH.

13.2.9.2.1 Living Coastal and Marine Resources

Affected Resources

As described in Chapter 3.3 of the Final Phase III ERP/PEIS, the Gulf of Mexico supports more than 15,000 marine species and includes many threatened and endangered species (NOAA 2011a). Detailed descriptions of the habitats and ecological communities found throughout the Gulf of Mexico can be found in Chapters 3.3.1 and 3.3.2 of the Final Phase III ERP/PEIS. This includes nearshore benthic communities including micro- and macro invertebrates such as mollusks, sponges, polycheates and crustaceans as well as infauna and epifauna. Further descriptions include oysters, pelagic microfaunal communities, sargassum, and finfish (demersal, pelagic, diadromous and freshwater fish).

Environmental Consequences

No Action

No action would maintain the existing level of effort for the GMT, Observer Program, and Texas Enforcement activities within the Gulf of Mexico, and programs would not be enhanced or expanded.

Proposed Actions

Section 6.3.9.6 of the Final Phase III ERP/PEIS describes the impacts to living coastal and marine resources from early restoration projects intended to restore and protect sea turtle populations.

Human activity and/or the use of equipment, vessels, or vehicles on coastal environments could result in short-term minor adverse effects to beach habitats and coastal organisms.

13.2.9.2.2 Protected Species

Affected Resources

Protected species and their habitats include ESA-listed species and designated critical habitats, which are regulated by either the USFWS or the NMFS. Protected species and habitat also include marine mammals protected under the Marine Mammal Protection Act, EFH protected under the Magnuson-Stevens Fishery Conservation and Management Act, migratory birds protected under the Migratory Bird Treaty Act and eagles protected under the Bald and Golden Eagle Protection Act.

Endangered Species

As described in Section 3.3.2.6 of the Final Phase III ERP PEIS, there are five species of sea turtles found within the Gulf of Mexico, all of which are listed under the ESA. All five species are migratory with a wide geographic range which includes the northern Gulf of Mexico and nesting can occur on any beach with suitable conditions. Section 13.2.1.2 summarizes the status of these five sea turtles in the Gulf of

Mexico and a more detailed discussion of these five sea turtle species can be found in Appendix A.5 of the Final Phase III ERP/PEIS.

Sections 3.3.2.8 (birds) and 3.3.2.9 (terrestrial wildlife) of the Final Phase III ERP/PEIS describe other species protected under the ESA that could occur in the project component area including terrestrial fauna. Further details on protected species and life stages of sea turtles can be found in Appendix 6 and Appendix 7 in the Final Phase III ERP/PEIS.

Essential Fish Habitat

The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. The habitat in the project component area includes the Gulf of Mexico waters and consists primarily of (soft bottom and sandy substrate) consistent with sediment along the northern Gulf of Mexico.

Marine Mammals

Marine mammals found within the Gulf of Mexico include 21 species of cetaceans (whales and dolphins) and the West Indian manatee. Six species of marine mammals in the Gulf are listed as threatened or endangered under the ESA, including the West Indian manatee, blue whale, finback whale, humpback whale, sei whale, and sperm whales.

A detailed discussion of protected marine mammals can be found in Section 3.3.2.7 of the Final Phase III ERP/PEIS.

Bald and Golden Eagles

Bald and golden eagles potentially forage within the project component location. A detailed discussion of protected Bald and Golden Eagles can be found in Section 3.3.2.7 of the Final Phase III ERP/PEIS.

Migratory Birds

Many species of birds spend all or a portion of their life cycle along the Gulf of Mexico using a variety of coastal habitats at different stages. Major groups of birds that inhabit coastal areas of the northern Gulf of Mexico include waterfowl and other water-dependent species, pelagic seabirds, raptors, colonial waterbirds, marsh-dwelling birds, and passerines. These groups are discussed in Chapter 3 of the Final Phase III PEIS. A detailed discussion of protected Migratory birds can be found in Section 3.3.2.7 of the Final Phase III ERP/PEIS.

Environmental Consequences

No Action

No action would maintain the existing level of effort for the GMT, Observer Program, and Texas Enforcement activities within the Gulf of Mexico, and programs would not be enhanced or expanded.

Proposed Actions

Section 6.3.9.6, 6.7.6.1 and 6.7.6.2 of the Final Phase III ERP/PEIS describes the impacts to living coastal and marine resources from early restoration projects intended to restore and protect sea turtle populations.

The proposed project component would include handling of sea turtles through NOAA's Observer Program, data collection including measurements, and tagging. Staff would follow existing protocols for response to live and dead sea turtles, including transport and collection. The Observer Program is currently authorized to handle sea turtles, and would be utilizing their existing authorities to handle sea turtles for this project component.

The proposed enhancement of the Observer Program would be performed in the same manner as authorized in the Observer Program permit (Permit No. 15552). The effects of the proposed project component to individual sea turtles would not be expected to differ from those analyzed in the July 2011 EA. Observers would only be authorized to take sea turtles up to the amount authorized in the permit and associated ESA Section 7 consultation biological opinion.

The EA for the Observer Program permit (Permit No. 15552) evaluates the effects of the following activities on sea turtles: handling and holding; measuring, weighing, and photographing; flipper and PIT tagging and carapace painting; release; and salvage. The project component would increase the number of observer sea days that operate under the Observer Program permit, but would not change any of the existing activities or protocols for the Observer Program when a sea turtle is observed. Therefore, the analysis completed in the EA for issuance of Permit No. 15552 also applies to this project component.

The GMT and Texas Enforcement project components would work to improve compliance with federal TED regulations. No direct impacts to protected species would be expected to occur as a result of this project component. The components are designed to improve overall TED compliance rates, which are expected to benefit individual sea turtles. Proper installation and use of TEDs would result in a 97% effectiveness of releasing sea turtles from shrimp trawl nets (NMFS 2014). These project components would increase the potential for sea turtle survival.

Negligible to minor, direct, adverse effects would occur to migratory birds, eagles, or marine mammals by disturbance from vehicles while beach driving or vessels on water; however, mitigation measures currently in place under the existing programs, such as providing information to workers on general awareness and means to avoid impacts to protected species and their habitats would minimize any potential impacts. Effects on these species would be temporary, local, and minor.

13.2.9.3 Human Uses and Socioeconomics

In addition to the ecological significance of its natural resources, and the diversity of its habitats, the Gulf of Mexico ecosystem is also culturally and socioeconomically important to the people of the Gulf coast and the United States. This section includes discussions cultural resources, land and marine management, and public health and safety concerns that are pertinent to Early Restoration.

13.2.9.3.1 Cultural Resources

Affected Resources

As described in the Chapter 3.4.2 of the Final Phase III ERP/PEIS, cultural resources refer to a range of traditional, archeological, and built assets. This may include historical properties in coastal communities or resources that are offshore including shipwrecks, archeological sites, structures, districts or Native American resources protected by a U.S. laws and regulations. Land resources are included in this category because of the level of protection granted by federal, state, and/or local governments. The following are included: National Wildlife Refuges, National Parks, State Parks, State Wildlife Management Areas, City/County parks, land trusts and/or Marine Protected Resources, National Estuarine Research Reserve System, National Marine Sanctuaries.

Environmental Consequences

No Action

No action would maintain the existing level of effort for the GMT, Observer Program, and Texas Enforcement activities within the Gulf of Mexico, and programs would not be enhanced or expanded. This alternative would have no additional effect on cultural resources.

Proposed Actions

No impacts to cultural resources are anticipated as the proposed actions are not anticipated to interact with cultural resources. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. A review of this project under Section 106 of the NHPA would be completed prior to project implementation.

13.2.9.3.2 Public Health and Safety

Affected Resources

Public health and safety issues relate to long-term program operations and maintenance of vehicles and equipment.

The proposed project component would be conducted following all applicable occupational OSHA safety regulations and laws to ensure the safety for all workers, and protect members of the general public. Vehicles have regulations and laws that are enforced to ensure that proper mechanical and operational hazards are minimized to the extent practicable.

Environmental Consequences

No Action

No action would maintain the existing level of effort for the GMT, Observer Program, and Texas Enforcement activities within the Gulf of Mexico, and programs would not be enhanced or expanded. This alternative would have no effect on public health and safety.

Proposed Actions

The proposed actions would ensure that proper safety measures are followed. No hazardous waste would be created due to the proposed action. In the event of a discharge of oil or release of hazardous substances, the release would be reported to the National Response Center (800-424-8802) and appropriate state agency as required. BMPs in accordance with OSHA, state, and local requirements would be incorporated into all activities. Personal protective equipment would be required for proper handling of sea turtles. Any impact would be minor, local and temporary, and only occur when vessels and/or vehicles are in use.

13.2.10 Overall Summary and Next Steps of Sea Turtle Early Restoration Project

The proposed Sea Turtle Early Restoration project involves a suite of actions to restore and protect sea turtles in the Gulf of Mexico. The Sea Turtle Early Restoration project consists of four project components. However, the EA is composed of three sections, based on observed similarities between the four components. The NEPA analysis of the environmental consequences of each component of this proposed project suggests that minor (or less) impacts to some resource categories and no moderate or major adverse impacts are anticipated to result from any of the project components described above. When environmental consequences were reviewed across the full Sea Turtle Early Restoration project, the analysis suggests that resources would either not be affected by project activities or have minor adverse and/or minor to moderate beneficial impacts.

Impacts to the physical environment from implementation of the Sea Turtle Early Restoration project would include:

- Minor long-term impacts to geology and substrates are associated with the construction of cabins.
- Minor impacts to hydrology and water resources, air quality, greenhouse gas emissions, and noise is expected.

Impacts to the biological environment from implementation of the Sea Turtle Early Restoration project would include:

- Some minor, temporary adverse impacts to living coastal and marine resources such as foraging shorebirds including piping plover and red knot could occur.
- Protected species were concluded to have beneficial impacts, not negative, because the enhanced STSSN and emergency response program would strive to help protected species through rescue, rehabilitation, and the bycatch reduction efforts would reduce mortalities of loggerhead, green and Kemp's ridley sea turtles.
- Kemp's ridley sea turtles would also benefit from nest protection activities occurring in Mexico and Texas.
- Long-term beneficial impacts are expected for loggerhead, Kemp's ridley, and green sea turtles, with additional benefits to leatherback and hawksbill sea turtles.

Impacts to human uses from implementation of the Sea Turtle Early Restoration project would include:

- Socioeconomics and Environmental Justice would not be impacted.
- Cultural resources are not expected to be impacted.
- Land and marine management and infrastructure was determined to have no adverse impact; however, beneficial impacts to land management and infrastructure at PAIS would occur by providing safe and needed infrastructure for patrollers.
- Short-term, minor impacts to aesthetics and visual resources and tourism and recreation would occur as a result of construction of new cabins.
- Minor, short-term adverse impacts to tourism and recreation could occur during the construction phase of the cabins.
- Infrastructure would not be adversely impacted and be benefited through the construction of safe, strategically located cabins and corrals.
- Public health and safety could have short-term minor impacts due to construction and due to the potential for hazardous materials spills through increased the use of marine vessels; however, safety procedures would minimize those impacts.

Overall, only minor (or less) adverse impacts are expected to occur to some resources while long-term beneficial impacts to sea turtles are expected as a result of this project component.

The Trustees have initiated coordination and review under the NHPA, Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and other federal statutes, where appropriate. Consultations and environmental reviews under the MSFCMA, MMPA, and CZMA have been completed for this Phase IV project.

To fulfill requirements and obligations under ESA, the Trustees initiated consultations pursuant to Section 7 of the ESA, as amended (16 U.S.C. 1531 et seq.) with the NMFS SERO's Protected Resources Division. The Trustees determined the proposed project has been the subject of a number of consultations or permitting actions under the ESA. This analysis has been summarized in an ESA Biological Evaluation form and it has been determined that no additional consultation with the USFWS for the proposed project is necessary (DOI 2015). Those analyses were summarized and provided in a memorandum to the appropriate USFWS Ecological Services offices in Florida, Alabama, Mississippi, and Texas for their information, and no further concurrence is necessary.The Trustees also reviewed the proposed project for impacts to bald eagles and migratory birds in accordance with the BGEPA and the MBTA and determined take would be avoided (DOI 2015). Refer to Phase IV ERP/EA Chapter 13, sections 13.2.5.4.2; 13.2.7.2.2; and 13.2.9.2.2.

Pursuant to Section 106 of the NHPA, a complete review of this project is ongoing to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Pursuant to the MSFCMA, NOAA reviewed the Sea Turtle Early Restoration Project for compliance with the MSFCMA, and had informational discussions with NMFS Southeast Regional Office (SERO's) Habitat Conservation Division (HCD) regarding Essential Fish Habitats (EFH). NOAA determined the project is not likely to adversely impact any EFH identified in the Gulf of Mexico Fishery Management Council's 2005 Generic EFH Amendment, or the NMFS Highly Migratory Species Fishery Management Plan. The SERO's HCD concurred with this and therefore concluded no consultation was required for the sea turtle project actions.

Pursuant to the MMPA, the Trustees have coordinated with NOAA SERO to determine that this project does not require authorization under the MMPA.

Pursuant to the CZMA of 1972, the Federal Trustees submitted a consistency determination for this project to the Texas General Land Office, the Louisiana Office of Coastal Management, the Mississippi Department of Marine Resources, the Alabama Department of Environmental Management, and the Florida Department of Environmental Protection via letters on May 21, 2015. Between June 22 and July 10, 2015, each of these agencies responded concurring with that determination of consistency on behalf of its state. As noted in several of the state responses, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in each state, as may be applicable.

Implementing Trustees would adopt and be required to implement project-specific mitigation measures (including BMPs) identified in this Final Phase IV Early Restoration Plan and completed consultations/permits. Oversight would be provided by the implementing Trustees. If effects to listed species or their habitat differ from the effects subject to consultation, including unintended consequences to such species, the Trustees would initiate (if no effect originally concluded) or re-initiate (for completed consultations) consultations with the regulatory agencies. Trustees would conduct due diligence with regard to ensuring no unanticipated effects to listed species and habitats occur, including ensuring that BMPs are implemented and continue to function as intended.

The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. Public comments and Trustee responses are found in Chapter 15.

13.2.11 Cumulative Impacts of the Sea Turtle Early Restoration Project

As discussed in Chapter 4, CEQ NEPA regulations require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined as "the impact on the 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" (40 C.F.R. §1508.7).

The proposed Sea Turtle Early Restoration project falls within the project type "Restore and Protect Sea Turtles" in the Final Phase III ERP/PEIS, and meets the evaluation criteria established by OPA and the Framework Agreement. The Final Phase III ERP/PEIS analysis of cumulative impacts relevant to the proposed action is incorporated by reference into the following cumulative impacts analysis for the Sea Turtle Early Restoration Project. The following analysis focuses on the potential cumulative effects of the proposed Sea Turtle Early Restoration Project to the effects of past actions evaluated in the Final Phase III ERP/PEIS cumulative impacts analysis and the effects of some past, present, and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS.

13.2.11.1 Site Specific Review and Analysis of Cumulative Impacts to Relevant Resources

This section describes past, present, and reasonably foreseeable future actions that were not discussed in the Final Phase III ERP/PEIS, but which are relevant to identifying any cumulative impacts the proposed Sea Turtle Early Restoration Project may have on a scale relative to this action. Context and intensity, defined in Section 13.2.2, are used to determine whether a potential significant cumulative impact from the sea turtle project exists.

Past, present and reasonably foreseeable other future actions relevant to this action, but not analyzed in the Final Phase III ERP/PEIS, were identified. Actions that could be relevant to the proposed sea turtle project cumulative impacts analysis are defined here as those actions with similar scope, timing, impacts and/or location. The Sea Turtle Early Restoration Project location is defined as the coastal beaches of Texas and along the coast of Tamaulipas, Mexico, and the coastal, nearshore and offshore environments of the Gulf of Mexico from Texas through the Florida Gulf Coast. Federal and state actions, other Phase IV proposed projects, and other restoration projects related to the Spill were considered. ESA Section 7 consultations completed by NMFS and USFWS were reviewed to determine if any actions are similar in scope, timing and impacts to the Sea Turtle Early Restoration Project. Additionally, ESA Section 10 permits issued by NMFS were evaluated for similar impacts, and all Phase IV projects were evaluated for similar impacts.

For the Sea Turtle Early Restoration project, specifically, the relevant affected resources analyzed in this EA are:

- Physical Environment (Air Quality and Greenhouse Gas Emissions and Noise)
- Biological Environment (Living Marine Resources and Protected Resources)
- Human Uses and Socioeconomics (Cultural Resources, Land and Marine Management, Infrastructure).

The following types of activities were identified as having potential impacts to similar resources as the proposed action:

13.2.11.1.1 Physical Environment

The Sea Turtle Early Restoration Project is not expected to contribute to any major, adverse impacts to the physical environment. Some minor, short-term effects on air quality, greenhouse gas emissions, and noise could occur on a highly localized scale at PAIS during the construction of corrals and cabins. Although the Project is not anticipated to cause significant impacts to the surrounding ecosystem, sea turtles are affected by multiple threats from the physical environment that may result from human activities. These include habitat degradation in the marine and terrestrial environment, entanglement and ingestion of marine debris, pollution from petrochemicals and other toxins, as well as climate change. Together these changes to the physical environment may affect sea turtle breeding, foraging, and survival. Further information on threats to sea turtles from changes to the physical environment can be found in the recovery plans for each individual species (NMFS and USFWS 1991, 1992, 1993, 2008; NMFS et al. 2011).

13.2.11.1.2 Biological Environment; Human Uses and Socioeconomics

The Sea Turtle Early Restoration Project is anticipated to create beneficial short- and long-term effects on biological resources (living coastal and marine resources including, EFH, protected species, marine mammals and seabirds). Enhancement of the STSSN and creation of an emergency response program aims to decrease mortalities of loggerhead, green, and Kemp's ridley sea turtles. Reduced mortality and increased survival will benefit individual sea turtles in the short term, and improve population dynamics and growth of future generations in the long term. Further, beneficial impacts to land management and infrastructure at PAIS would occur in the long-term by providing safe and needed infrastructure for sea turtle patrollers.

The following types of activities and human uses were identified as having potential impacts to similar resources as the proposed action:

Commercial Fisheries

The proposed project includes a component with data collection and research on sea turtles that are observed incidentally captured in the shrimp trawl fishery. Commercial fisheries have incidentally taken sea turtles for decades though the magnitude of take by fisheries as a whole has likely changed over time as a result of the protection of sea turtles under the ESA, population declines, changes in fishing practices, and the management of turtle take by fisheries. While regulated, the take of sea turtles in fisheries operating within the Gulf of Mexico are expected to continue for the foreseeable future. A summary of the effects on sea turtles from these fisheries and programs is provided here to provide a more comprehensive discussion related to cumulative effects.

The effects of fishery operations on sea turtles are not limited to the fisheries described in the Proposed Action. The operation of a fishing vessel in waters where sea turtles may be encountered poses some threat to these species due to risk of collisions with moving vessels. Sea turtles also interact with fishing gear such as longlines, hook and line, and bandit reel gear through hooking or entanglement in the fishing gear. Turtles that are hooked by this gear can be injured or killed by the hooking event,

depending on whether they are hooked internally or externally and whether the hook sets deep in their tissue. Interaction with fishing gear can have long-term effects on a turtle's ability to swim, forage, migrate, and breed, although these effects are difficult to monitor or measure.

Pound nets, traps, pots, gillnet and trawl fisheries can entangle or entrap sea turtles. Sea turtles are particularly prone to entanglement as a result of their body configuration and behavior. Records of stranded or entangled sea turtles reveal that fishing debris can wrap around the neck, flipper, or body of a sea turtle and severely restrict swimming or feeding.

In the Gulf of Mexico, NMFS has issued Biological Opinions authorizing the bycatch of sea turtles under ESA Section 7, for the following fisheries:

- The Pelagic Longline Fishery
- The South Atlantic Snapper-Grouper Fishery
- The Coastal Migratory Pelagic Fish Fishery
- The Shark Fishery
- The Shrimp Trawl Fishery

Research Permits

NMFS actively issues research permits to researchers on sea turtle species in areas that could overlap with the proposed action area. The effects of many individual research activities (e.g., a survey, a field trip to capture animals) are short-term, lasting hours to days following the research event. Due to the 10 year duration and wide-spread activities included within the proposed project, it is difficult to specifically identify the extent of overlap in time and space of all of the permitted research, or to identify the frequency with which any given local population may be disturbed.

Other Human Activities

Historically, one of the major contributors to declines in sea turtle populations was the commercial harvest of eggs and turtles. Today, sea turtles may be adversely affected by human activities including recreational fishing (as bycatch via entrapment and entanglement in fishing gear) as well as tourism and recreation (via harassment from human approach and presence) within the action area. Of these activities, lethal takes of turtles and the disturbance that results in displacement of animals or abandonment of behaviors such as feeding or breeding by groups of animals are more likely to have cumulative effects on the species than the proposed research activities.

Sea turtles also benefit from human activities operated by Federal, state, and or local agencies and organizations including management, conservation, and recovery efforts, nest monitoring, education and outreach, and stranding response programs.

13.2.11.2 Potential Cumulative Impacts When Evaluated with Other Phase IV Proposed Projects

Due to the nature of the proposed project, it is not anticipated to contribute to potential adverse cumulative impacts in combination with other Phase IV projects. There are two Phase IV projects that may create cumulative beneficial impacts to sea turtle species when evaluated together. The Pelagic Longline Bycatch Reduction Project is closest in relationship to the sea turtle project in that it intersects with Gulf of Mexico fisheries activities. Because the two proposed actions affect distinct fisheries, however, no adverse cumulative impacts are possible. Further, as both proposed projects are intended to restore and protect marine resources, together they contribute to cumulative beneficial impacts to Trustee trust resources in the Gulf of Mexico environment. Additionally, the Seagrass Recovery Project at Gulf Islands National Seashore, also proposed in Phase IV, would result in potential cumulative benefits to sea turtles because restoration of seagrass beds in the Florida panhandle could provide important foraging grounds and habitat for green sea turtles.

Beyond these described Phase IV projects, other *Deepwater Horizon* restoration efforts that could contribute to cumulative benefits to sea turtles include: (1) the Florida Seagrass Recovery Project outlined in the Phase III ERP/PEIS; (2) the Improving Habitat Injured by the Spill Response: Restoring the Night Sky Project described in the Phase II ERP/ER; and (3) the Eliminating Light Pollution on Sea Turtle Nesting Beaches project supported by the National Fish and Wildlife Foundation (NFWF) Gulf Environmental Benefit Fund (GEBF). The Florida Seagrass Recovery Project addresses damage to boating scars in turtle grass beds within St. Joseph Bay, a known foraging habitat for green sea turtles (NMFS and USFWS 2007a). Both the Improving Habitat Injured by the Spill Response: Restoring the Night Sky project and the Eliminating Light Pollution on Sea Turtle Nesting Beaches project create direct benefits for loggerhead sea turtles through installation of turtle-friendly lighting. Shoreline light pollution threatens sea turtles by causing hatchling misorientation and disorientation, and these projects aim to increase survivorship in prime nesting areas on the Florida panhandle and Alabama coast.

13.2.11.3 Summary of Cumulative Impacts of the Proposed Action

Overall, the cumulative impact of the proposed Sea Turtle Early Restoration Project when considered with respect to past, present, and reasonably foreseeable future actions would result in beneficial impacts over the long-term, as restoration would contribute to the restoration and protection of endangered and threatened sea turtles, while minimizing socioeconomic impacts on the public.

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Chapter 14: Pelagic Longline Bycatch Reduction Project

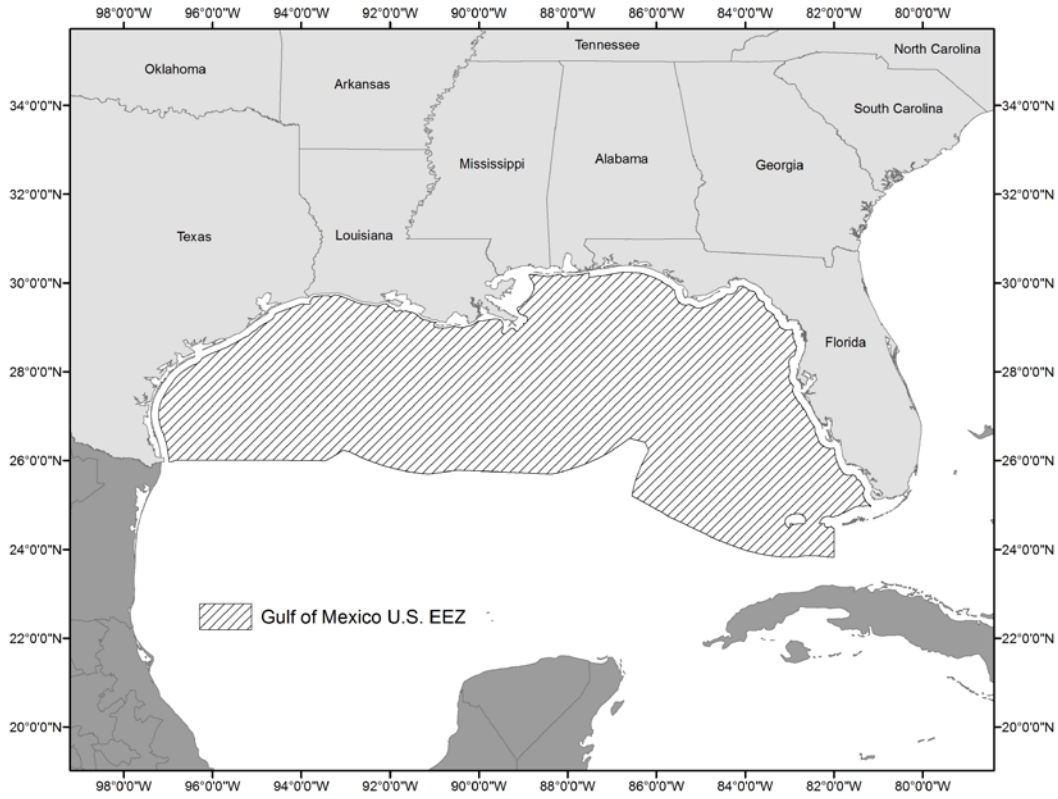
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14.1 Pelagic Longline Bycatch Reduction Project Description

14.1.1 Project Summary

The Pelagic Longline Bycatch Reduction Project is intended to restore pelagic fish biomass through actions that are expected to reduce fish mortality from bycatch and regulatory discards in the portion of the U.S. Atlantic pelagic longline (PLL) fishery operating in the Gulf of Mexico (GOM) (referred to in this document as the GOM PLL fishery). The GOM PLL fishery primarily targets yellowfin tuna and swordfish, but incidentally catches and discards other fish, including marlin, sharks, bluefin tuna (which, by regulation, is not a target of fisheries in the GOM), as well as smaller individuals of the target species. The project will compensate PLL fishermen who agree to voluntarily refrain from PLL fishing in the GOM during an annual six- month repose period that coincides with the bluefin tuna spawning season. The project will also provide participating fishermen with two alternative gear types to allow for the continued harvest of yellowfin tuna and swordfish during the repose period when PLL gear is not used.

Figure 14-1. Pelagic Longline Bycatch Reduction Project location is the U.S. Exclusive Economic Zone (EEZ) in the Gulf of Mexico indicated by the shaded area



14.1.2 Background and Project Description

The GOM PLL fishery uses pelagic longline gear to target yellowfin tuna and swordfish. Longlining employs a mainline from which individual hooks are suspended at intervals of 250 to 350 feet along mainlines ranging from 20 to 40 miles in length (see Figure 14-2). A variety of bait is used, including Atlantic mackerel and squid, with the hooks attached to the mainline by monofilament branch-lines called gangions. Floats are spaced along the mainline, to keep the mainline lifted horizontally in the water with the gangions hanging vertically in the water. PLL gear is indiscriminate in regard to species caught, resulting in the catch of non-target species, called bycatch. Due to the soak time of the gear, the bycatch[1] is often dead when the gear is hauled-back. In addition to bycatch of fish, PLL gear may also interact with protected species such as marine mammals, sea turtles, and seabirds, resulting in the injury and possible loss of individuals of these species.

The Pelagic Longline Bycatch Reduction Project (PLL Project) aims to reduce bycatch associated with the GOM PLL fishery and includes two integrated actions. The first action is a compensation-based voluntary annual 6-month (January through June) repose from PLL fishing in the GOM, to coincide with bluefin tuna spawning season. During the repose period, participating fishermen could continue to fish for yellowfin tuna and swordfish but using only the alternative fishing gear types described below.

The second action comprising the PLL Project is the provisioning of two alternative gear types to PLL fishermen participating in the repose period: greenstick gear (see Figure 14-3) and/or buoy gear (see Figure 14-4). During the PLL repose period, fishers will be able to use the alternative gears to harvest targeted species. Greenstick gear is trolled to target yellowfin tuna. Buoy gear is set to target swordfish. These two fishing gear types have been widely discussed for their potential effectiveness in reducing the dead discards associated with directed fisheries for yellowfin tuna and swordfish in the Gulf of Mexico. Both gear types are in use in other regions of the U.S. Atlantic Highly Migratory Species (HMS) fishery, but are used much less by fishermen in the GOM. Both have been the topic of recent gear-efficiency and bycatch experiments using observers on commercial fishing vessels. The goal of providing alternative gears for use during a PLL repose period is to reduce adverse financial impact to fishers and help maintain local economies. As part of the project, technical extension services (research, outreach, and training on the use of the alternative gear types) will be provided to participants to educate users and tune alternative gear to maximize effectiveness.

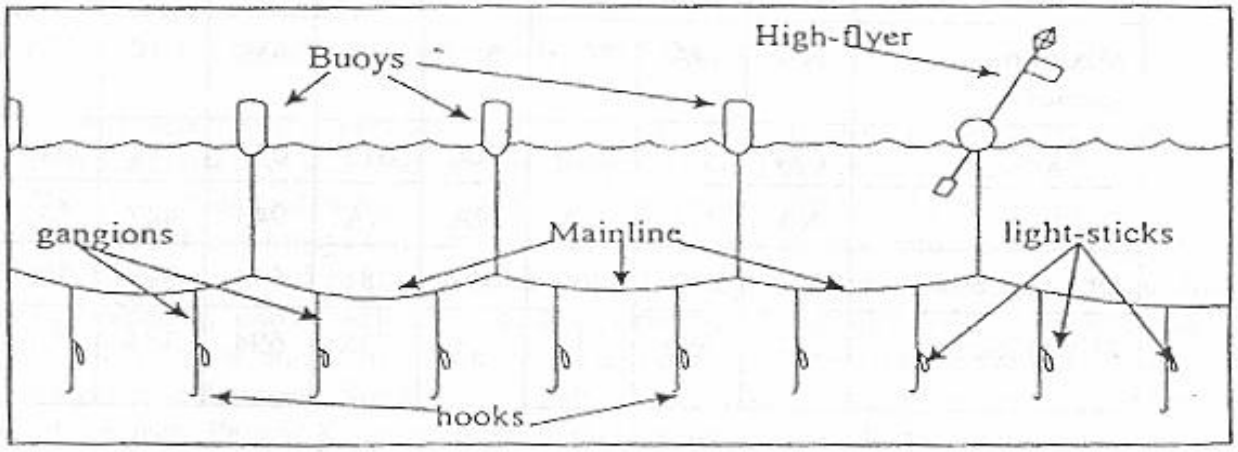
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[1] Bycatch, as defined in Magnuson-Stevens Fishery Conservation and Management Act Section 3 is, "Fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards." Regulatory discards are, “fish harvested in a fishery which fishermen are required by regulation to discard whenever caught, or are required by regulation to retain but not sell.” Economic discards are, “fish which are the target of a fishery, but which are not retained because of an undesirable size, sex, or quality, or other economic reasons”. Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Public Law 94-265, Sec. 3 Definitions, as Amended October 11, 1996, http://www.nmfs.noaa.gov/sfa/magact/mag1.html#s3

The duration of the PLL Project is dependent upon the number of fishermen volunteering to participate each year, but is expected to be in place from 5 to 10 years. The first year will target establishing contracts and/or other arrangements necessary to support implementation. In the following years, fishers will participate in the voluntary PLL repose and implement use of the alternative gears. Project features are designed and budgeted to reach 60 vessel-years of participation. A "vessel-year" equals participation of a single vessel during the repose period in a single calendar year. As an example, 15 vessels participating for 4 years would total 60 vessel-years, as would 10 vessels participating for 6 years. Utilizing vessel-years allows for accurate anticipation of benefits while providing flexibility for varying levels of participation.

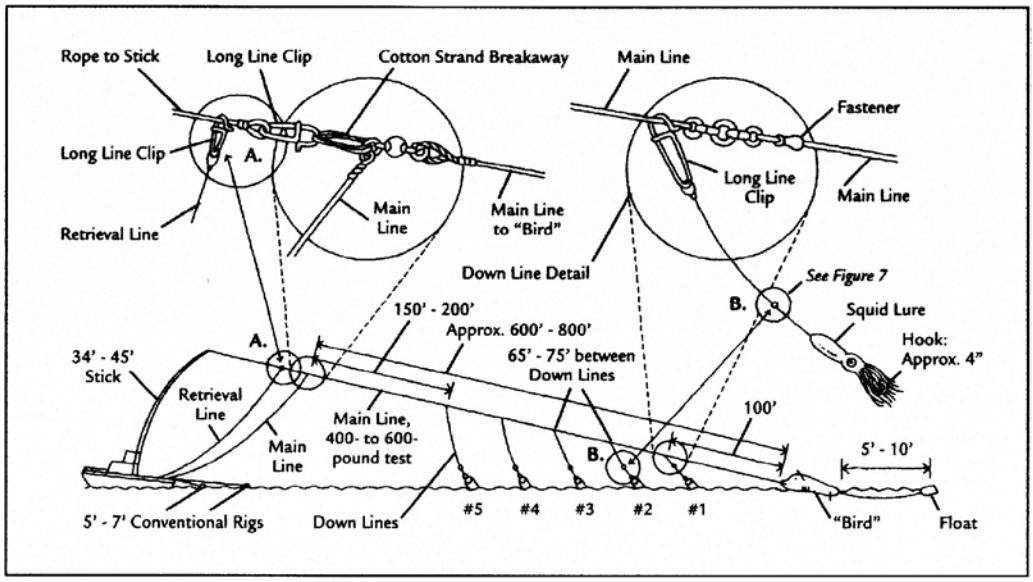
The PLL Project will evaluate the catch and bycatch of PLL and alternative gear operations in the GOM. The project will analyze monitoring data from the GOM PLL fishery provided through the routine ongoing observer coverage of the fishery conducted by the National Marine Fisheries Service (NMFS) Pelagic Observer Program, and will monitor vessels that transition to greenstick and buoy gear through additional observer coverage included as part of the PLL Project.

Figure 14-2. Typical U.S. Pelagic Longline Gear



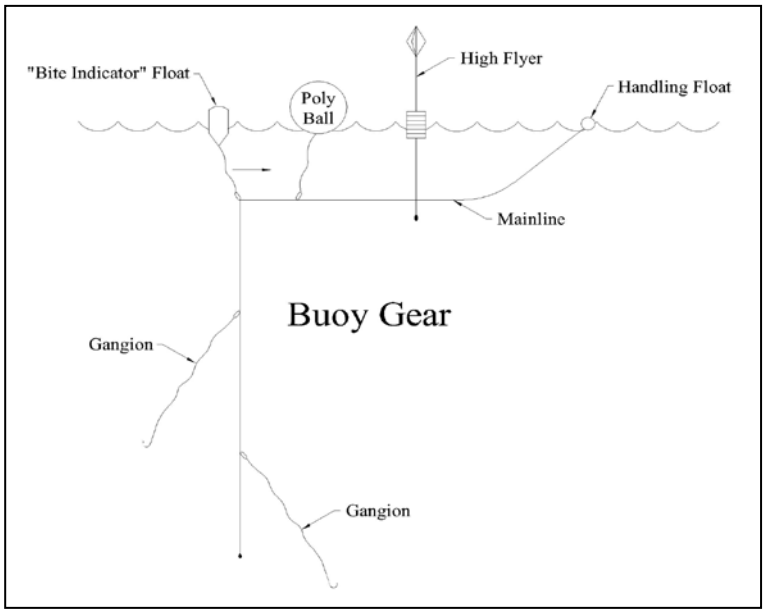
Source: Arocha 1997.

Figure 14-3. Greenstick Fishing Rig



Source: Wescott1996.

Figure 14-4. A Diagram of a Buoy Gear with Four Floatation Devices Attached



Source: Courtesy of Dave Meyer, reproduced from the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan. (http://www.nmfs.noaa.gov/sfa/hms/documents/fmp/consolidated/index.html)

14.1.3 Evaluation Criteria

The Final Phase III ERP/PEIS determined that the preferred alternative, Alternative 4 (Contribute to Restoring Habitats, Living Coastal and Marine Resources, and Recreational Opportunities) is consistent with the programmatic evaluation criteria (Phase III Section 5.3.8). Alternative 4 contributes more broadly to the Trustee's goal of making the environment and the public whole, using techniques that are commonly utilized, feasible, and highly likely to succeed. As described in the Final Phase III ERP/PEIS, the Trustees carefully considered the potential beneficial and adverse impacts of the combination of ecological and recreational use project types proposed in Alternative 4 and selected it as the preferred alternative. Alternative 4 includes the project type, Restore and Protect Finfish and Shellfish.

This PLL Project, consistent with the Final Phase III ERP/PEIS project type, Restore and Protect Finfish and Shellfish, also meets the evaluation criteria under the Framework Agreement and OPA regulations (15 CFR 990.53 (a)(2); 15 C.F.R. § 990.54(a) and Sections 6a-6e of the Early Restoration Framework Agreement).

Animals including small and large pelagic fish were exposed to oil and dispersants in the water column as a result of the Spill. The project will replace pelagic fish biomass like that lost due to the Spill by reducing dead discarded bycatch of pelagic fish in the GOM PLL fishery. Thus, the nexus to resources injured by the Spill is clear (15 CFR 990.54 (a)(2)).

The project is technically feasible and utilizes proven techniques with established methods and documented results (15 CFR 990.53 (a)(2)). Reducing fishing effort has been a widely accepted tool in managing fisheries to rebuild and sustain fish stocks. In the U.S. Atlantic PLL fishery, similar efforts were implemented in 1999 through regulations establishing limited access permitting. The repose period will reduce PLL effort, resulting in fewer PLL hook sets. In addition, the repose period will completely eliminate dead discarded bycatch from participating PLL vessels. Reduction in bycatch is also a widely used tool for the protection and restoration of non-target species. This project is consistent with National Standard 9 of the Magnuson-Stevens Fishery Conservation and Management Act: *Conservation and management measures shall, to the extent practicable, (a) minimize bycatch and (b) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.* Work by the National Oceanic and Atmospheric Administration (NOAA) and other research has shown that the alternative gears proposed for use are more discriminate than PLL gear in regards to the species targeted and have been shown to have low mortality of bycatch (Kerstetter et al. 2014). For these reasons, the project has a high likelihood of success (See 15 C.F.R. § 990.54(a)(3) and Section 6e of the Early Restoration Framework Agreement).

The estimated project cost includes estimates of the costs to implement both project components. Cost estimates for the compensation-based repose component are based on catch and dockside value data collected by NMFS through the Pelagic Observer Program and Atlantic HMS logbooks. Cost estimates for the provisioning and installation of alterative gear are based on market research. The project can be conducted at a reasonable cost (See 15 C.F.R. § 990.54(a)(1)).

Components of the PLL Project were submitted as a restoration project on the NOAA website (http://www.gulfspillrestoration.noaa.gov).The project will restore fisheries resources without causing additional injuries to any natural resources. It also avoids or minimizes adverse effects on the important resource services realized through the continued operation of U.S. Atlantic HMS fisheries in the long-term. As a result, collateral losses will be avoided or minimized during project implementation (15 C.F.R. § 990). The project is not inconsistent with long-term restoration needs (Sections 6d-6e of the Early Restoration Framework Agreement). The PLL Project is consistent with management and conservation efforts being undertaken under other authorities, including the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), the Atlantic Tunas Convention Act (ATCA), and Amendment 7 to the 2006 Consolidated HMS Fishery Management Plan (FMP): Bluefin Tuna Management.

In addition to the NRDA and Framework Agreement evaluation criteria above, Trustees applied a screening process to be responsive to the purpose and need for conducting Early Restoration based on evaluation criteria (Section 2.1.2.2 Phase III ERP/EIS). Consistent with criteria applied in previous phases of Early Restoration, NOAA's project screening process included the application of the restoration evaluation criteria, as well as identification of projects that would restore for injuries specifically to NOAA trust resources. Further, NOAA prioritized projects that would have benefits to both nearshore and offshore trust resources. NOAA sought to partner with other Trustees to propose and implement Early Restoration projects that address injuries to NOAA trust resources, and comply with the project evaluation criteria.

14.1.4 Performance Criteria and Monitoring

Monitoring for the PLL Project will occur during the Project's implementation (i.e., the time to reach 60 vessel-years of participation in repose, anticipated to be 5 -10 years). Monitoring and adaptive management efforts will follow guidelines established by the PLL Project Monitoring Plan. Monitoring for this project will be characterized by annual data collection from vessels participating in the PLL Project as well as from vessels participating in the GOM PLL fishery. Data will be collected to ensure PLL Project participation is in alignment with agreements, alternative gear efficiency (catch per unit effort) is understood and improves over time, and bycatch is reduced in the GOM. Corrective actions could be taken by the implementing Trustee (NOAA) to ensure the project meets the following objectives:

- Reduce discards in the GOM PLL fishery
- Minimize economic effects from potential reductions of catches of target species through use of alternative gears in the GOM

Monitoring will be used to evaluate the PLL Project's performance and to determine the need for corrective actions (*i.e.* adaptive management). Monitoring is anticipated to measure parameters such as:

- Number of project agreements executed and their duration; including vessels participating in repose and gear conversion
- Quantity (count by size) and disposition of bycatch and discards by species

- Quantity (count by weight, size, and product grade) and price of landings of fishery target species
- Expenses, target product value and net profit per effort
- Gear configuration, set parameters, and environmental parameters experienced while fishing
- Dead discard rate by species
- Technology transfer and cooperative extension of alternative gear technology (e.g. number of demonstrations or workshops)

The monitoring plan for this project can be found in Appendix B.11.

14.1.5 Operations and Maintenance

Participation in the repose and alternative gear project components will be accomplished through compensation-based voluntary participation by willing vessel owners. Contractual agreements with vessel owners will set forth participation requirements and compensation details. Alternative gear provisioning and installation as well as training and support during initial gear setup/tuning will be funded through the project.

Data collected through monitoring activities for the PLL project will inform gear improvement efforts which will be designed to increase alternative gear catch efficiency in the GOM. The results of the gear improvement component will be relayed to participants via technological exchange presented as additional training.

Utilization or expansion of existing NMFS resources and programs (i.e. NMFS Vessel Monitoring System Program: http://www.nmfs.noaa.gov/ole/about/our_programs/vessel_monitoring.html) will provide managers for the PLL Project with the ability to remotely monitor project participants to support enforcement of compliance with contracts/agreements.

The Vessel Monitoring System (VMS) is a satellite surveillance system primarily used to monitor the location and movement of commercial fishing vessels in the U.S. Exclusive Economic Zone (EEZ) and treaty areas. The system uses satellite-based communications from on-board transceiver units, which PLL vessels are required to carry. The transceiver units send position reports that include vessel identification, time, date, and location, and are mapped and displayed on the end user's computer screen.

By monitoring the location, direction, and speed of the vessel, fisheries managers can make inferences regarding vessel operation including the type of gear being actively fished. Electronic monitoring systems (EMS) supporting video acquisition to record fishing effort are currently being installed on vessels participating throughout the U.S. Atlantic PLL fishery and may be available to support effective management of implementation of the PLL Project.

14.1.6 Offsets

For purposes of negotiating Offsets with BP in accordance with the Framework Agreement, the Trustees used a Resource Equivalency Analysis to estimate pelagic finfish, sea turtle, and dolphin offsets. Pelagic finfish offsets (expressed in kilograms of pelagic finfish biomass), turtle offsets (expressed as adult turtle mortalities avoided), and dolphin offsets (expressed as adult dolphin mortalities avoided) were calculated.

All Offsets listed in the table below use a discounting rate to convert offset produced each year to a common base year for comparison. Discounted pelagic finfish (including Atlantic HMS[2] and other species such as; dolphin (mahi), wahoo, and others), dolphin (marine mammals), and turtle Offsets were estimated based on data collected from the GOM PLL fishery through the Pelagic Observer Program and other sources. Offsets assume that participation by a vessel will result in elimination of dead discards of pelagic finfish during the term of participation. The Offsets listed in each of the following three tables (Table 14-1, Table 14-2, and Table 14-3) are only applicable to injuries to these same species categories and types in the GOM as determined by the Trustees' total assessment of injury for the *Deepwater Horizon* Spill.

Table 14-1. Finfish Offsets agreed to by BP and the Trustees

Pelagic Finfish Offsets (kilograms of pelagic finfish biomass)	
Fish Category Name	**Weight in Discounted Kilograms (dkg)**
Bluefin Tuna	50,500
Deepwater Fish	47,620
Shark	206,312
Tuna/Mackerel/Billfish	395,328
Jacks & Related Fishes	240

Table 14-2. Marine mammal Offsets agreed to by BP and the Trustees

Dolphin Adult Mortalities Avoided		
Common Name	**Scientific Name**	**Number of Discounted Individuals**
Risso's Dolphin	*Grampus griseus*	2
Bottlenose Dolphin	*Tursiops truncates*	1
Pantropical Spotted Dolphin	*Stenella attenuate*	1

[2] Highly migratory species (HMS) encompasses the following fishery management units: bluefin, bigeye, yellowfin, albacore, and skipjack tunas; swordfish; sharks; and billfish (Atlantic Highly Migratory Species 50 CFR 635).

Table 14-3. Sea Turtle Offset agreed to by BP and the Trustees

Sea Turtle Adult Mortalities Avoided		
Common Name	**Scientific Name**	**Number of Discounted Individuals**
Leatherback Sea Turtle	*Dermochelys coriacea*	2.6

Fish families were grouped into five categories as agreed to with BP. Bluefin tuna is the only category representing a single species, due to the unique management considerations for this species.

Table 14-4. Pelagic Finfish Categories agreed to between BP and the Trustees

Pelagic Finfish Category Definitions	
Category Name	**Families**
Bluefin Tuna	*Thunnus thynnus* (only species included)
Deepwater Fish	Alepisauridae, Anoplogastridae, Moridae, Sternoptychidae, Stomiidae, Bathylagidae, Myctophidae, Gonostomatidae, Bramidae, Bregmacerotidae, Diceratiidae, Caristiidae, Caulophrynidae, Ceratiidae, Chiasmodontidae, Evermannellidae, Alepocephalidae, Nomeidae, Derichthyidae, Diretmidae, Saccopharyngidae, Melanostomiidae, Macrouridae, Giganturidae, Platytroctidae, Howellidae, Hygophum, Phosichthyidae, Luvaridae, Melamphaidae, Melanonidae, Microstomatidae, Mirapinnidae, Nemichthydae, Omosudidae, Oneirodidae, Paralepididae, Leptochilichthyidae, Echeneidae, Rhinochimaeridae, Scopelarchidae, Serrivomeridae, Tetragonuridae, Trachipteridae, Gempylidae, Scombrolabracida; and other deepwater fish of the same trophic level within the GOM PLL fishery.
Tuna/Mackerels/Billfish	Scombridae (except *Thunnus thynnus*), Coryphaenidae, Istiophoridae, Xiphiidae
Sharks	Alopiidae, Scyliorhinidae, Carcharhinidae, Odontaspididae, Centrophoridae, Etmopteridae, Ginglymostomatidae, Lamnidae, Mitsukurinidae, Triakidae, Rhincodontidae, Sphyrnidae, Squalidae, Squatinidae
Jacks & Related Fishes	Albulidae, Carangidae, Elopidae, Pomatomidae, Rachycentridae, Megalopidae

14.1.7 Estimated Cost

The estimated cost of the PLL Project is $20,000,000. This cost reflects estimates of implementation costs developed from the anticipated plan for the PLL Project at the time of negotiations. The estimated cost includes provisions for the annual 6-month PLL fishing repose, providing alternative gear for participating fishers, project implementation, extension services and monitoring.

14.2 Pelagic Longline Bycatch Reduction Project: Environmental Assessment

14.2.1 Introduction and Background, Purpose and Need

14.2.1.1 Introduction

This project is proposed as part of Phase IV of the Early Restoration program. This EA tiers from the 2014 Final Phase III ERP/PEIS which provides broad, programmatic environmental analyses of project types for Phase III and future phases of Early Restoration. This EA qualifies for tiering from the Final Phase III ERP/PEIS in accordance with Department of the Interior regulations (43 CFR 46.140, Using tiered documents) under "b" and "c" (Section 1.6.2, Basis for Tiering). This tiering is also consistent with NOAA Administrative Order 216-6, "Environmental Review Procedures for Implementing the National Environmental Policy Act", Section 5.09c. This project is consistent with Alternatives 2 "Contribute to Restoring Habitats and Living Coastal and Marine Resources" (Section 5.3.3) and 4 (Preferred Alternative), "Contribute to Restoring Habitats, Living Coastal and Marine Resources, and Recreational Opportunities" (Section 5.3.7), and more specifically the project type, "Restore and Protect Finfish and Shellfish." By tiering, this EA provides the requisite additional detail for a project-level NEPA analysis that considers potential site specific impacts anticipated from implementation of the proposed action and the no action alternative. See Chapter 1.3 of this document for information on the Final Phase III ERP/PEIS and tiering of the Phase IV proposed projects.

This project is consistent with the Final Phase III ERP/PEIS' Preferred Alternative as described and selected in the 2014 Record of Decision (79 *FR* 64831-64832 (October 31, 2014)) and the Trustees find that the conditions and environmental effects described in that broader NEPA document (with updates to that information as described in Chapter 2 of this document) are still valid. Specifically, the EA for the proposed PLL Project tiers from the analyses found in the sections of the Final Phase III ERP/PEIS that describe Alternatives 2 (Contribute to Restoring Habitats and Living Coastal and Marine Resources) and 4 (Contribute to Restoring Habitats, Living Coastal and Marine Resources and Recreational Opportunities):

- Chapter 5: Proposed Early Restoration Programmatic Plan: Development and Evaluation of Alternatives: Descriptions of Alternatives 2 (Section 5.5.3 Contribute to Restoring Habitats and Living Coastal and Marine Resources) and 4 (Section 5.3.7 Preferred Alternative: Contribute to Restoring Habitats, Living Coastal and Marine Resources and Recreational Opportunities), Section 5.3.3.7 Restore and Protect Finfish and Shellfish.
- Chapter 6: Environmental Consequences, Section 6.3.7, Project Type 7, Restore and Protect Finfish and Shellfish, and 6.4, Alternatives 2 (and 4): Human Uses and Socioeconomics.
- Chapter 6.8: Potential Cumulative Impacts

This EA incorporates by reference the analysis found in those sections of the Phase III PEIS. This EA also incorporates by reference all introductory, process, background, and Affected Environment information and discussion provided in the PEIS (Chapters 1 through 6).

NMFS produces an annual Stock Assessment and Fishery Evaluation Report (SAFE) that reviews the current status of Atlantic HMS fish stocks (tunas, swordfish, billfish, and sharks) and describes the year's accomplishments in managing Atlantic HMS. The reports provide public information on the latest developments in Atlantic HMS management. Content and analysis relevant to status of the stocks, essential fish habitat (EFH), fishery data, economic status of HMS fisheries, community profiles, and bycatch, incidental catch and protected species are relevant to this PLL Bycatch Reduction Project and have been utilized in analysis for this action. SAFE Reports for the years 2008, 2011 and 2014 (NMFS 2008b, NMFS 2011, NMFS 2014b) are incorporated by reference for specific fishery information provided in each report.

In addition, this EA incorporates by reference background descriptions and analysis found in the Final Amendment 7 to the 2006 Consolidated HMS FMP (NMFS 2014a), which provides further description of the Affected Environment (Section 3) and Environmental Consequences (Sections 4 and 5) related to the biological and ecological consequences and socioeconomic impacts related to the GOM PLL fishery.

14.2.1.2 Background

The U.S. Atlantic PLL fishery for Atlantic HMS primarily targets swordfish, yellowfin tuna, and bigeye tuna in various areas and seasons. Secondary target species include dolphin (mahi), albacore tuna, and, to a lesser degree, sharks. Although this gear can be modified (e.g., depth of set, hook type, hook size, bait, etc.) to target swordfish, tunas, or sharks, it is generally a multi-species fishery. Further, while it targets swordfish, yellowfin tuna and bigeye tuna, the fishery incidentally catches and discards other fish, including marlin, sharks, bluefin tuna (which, by regulation, is not a target of the U.S. Atlantic PLL fishery anywhere it operates or for any U.S. fisheries in the GOM), as well as smaller individuals of the target species. PLL vessel operators are opportunistic, switching gear style and making subtle changes to target the best available economic opportunity on each individual trip. PLL gear sometimes attracts and hooks non-target finfish with little or no commercial value as well as species that cannot be retained by commercial fishermen under applicable fishery regulations, such as billfish. PLL gear may also interact with protected species such as marine mammals, sea turtles, and seabirds. Any species that cannot be landed under fishery regulations (or undersized catch of permitted species) is required to be released, regardless of whether the catch is dead or alive.

The offshore pelagic environment experienced oiling as a result of the Spill. Oil and gas released from the wellhead was transported at depth or rose from the wellhead to the surface of the water and was volatilized to the atmosphere or moved with surface waters (Camilli et al. 2010). To help evaluate impacts to water column organisms, the Trustees have gathered and analyzed information on the density and abundance of those organisms, including variations in their distribution over space and time. Preliminary Trustee analysis suggests that tens of thousands of square miles of surface waters were affected by oiling and that hundreds of cubic miles of surface water may have contained petroleum compounds at concentrations associated with mortality to sensitive aquatic organisms. Animals exposed in the water column include small and large pelagic fish, demersal fish that live near the bottom of the ocean, invertebrates, and planktonic organisms. The proposed PLL Project is intended

to restore pelagic fish biomass through integrated actions that would reduce fish mortality from bycatch in the GOM PLL fishery.

14.2.1.3 Purpose and Need

The purpose and need for this action falls within the scope of the purpose and need of the programmatic portions of the Final Phase III ERP/PEIS because it would accelerate meaningful restoration of injured natural resources and their services resulting from the Spill. The proposed project's purpose is to begin to replace pelagic fish biomass like that lost due to the *Deepwater Horizon* Spill by implementing a bycatch reduction project. The action would support resource sustainability and fisheries management while minimizing socioeconomic impacts on the target fisheries. The proposed project is needed to reduce fish mortality from bycatch and regulatory discards in the GOM PLL fishery. The species impacted by the GOM PLL fishery vary greatly (see families in Table 14-4) and provide a wide variety of ecosystem services. Without this action, dead bycatch otherwise caused by the participating vessels would be discarded, reducing their ecological value potential and removing them from the reproductive population.

14.2.2 Scope of the EA

This project is proposed as part of Phase IV of the Early Restoration plan. This EA tiers from the Final Phase III ERP/PEIS. The broader environmental analyses of these types of actions as a whole are discussed in the Final Phase III ERP/PEIS from which this EA is tiered. The information and analyses in this document supplements the programmatic analyses with site-specific information. This EA provides NEPA analysis for potential impacts for site specific issues and concerns anticipated from implementation of the proposed action and the no action alternatives.

14.2.3 Project Alternatives

No Action:

Both OPA and NEPA require consideration of the No Action alternative. For this Draft Phase IV ERP/EA, the No Action alternative assumes that the Trustees would not pursue the proposed PLL Project as part of Early Restoration. Under No Action, the existing conditions described in Chapter 2, Affected Environment would prevail. Restoration benefits associated with this project would not be achieved at this time.

A restoration project utilizing a PLL fishing repose and provisioning of two alternative gear types would not be implemented at this time. Fishing vessels would not enter into agreements to cease fishing with PLL gear during 6-month periods of each year, thus there would be no associated reduction in fishing effort with PLL. Fishing with PLL, greenstick, and buoy gear in the GOM would be expected to continue at current levels.

Proposed Action: Implement the proposed PLL Project as described:

- Annual 6-month repose for PLL fishing in the GOM over the project duration, to coincide with bluefin tuna spawning season, implemented via a compensation-based volunteer program in the GOM PLL fishery.
- Provisioning of two alternative gear types to PLL fishermen participating in the repose period: greenstick gear and/or buoy gear. During the PLL repose period, fishers would be allowed to use the alternative gears to harvest targeted species (See 14.1 for the PLL Project Description).

14.2.3.1 Other Alternatives Considered

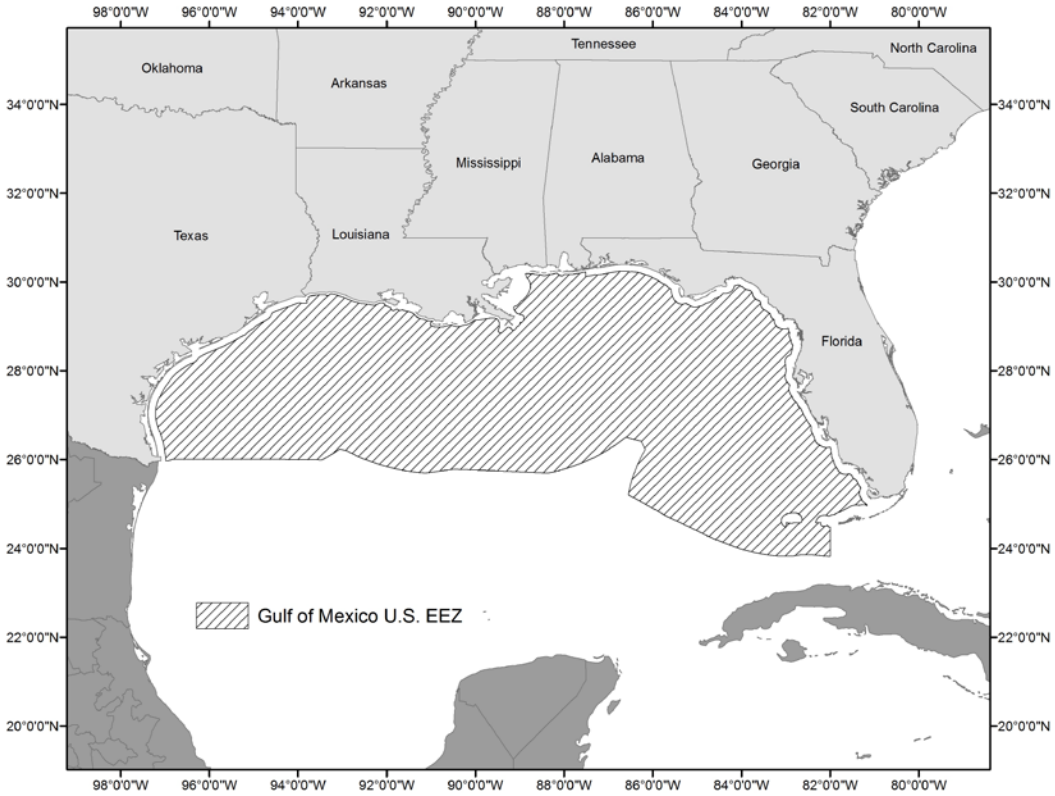
The Trustees' Early Restoration project selection process is described in Section 2.1 of the Phase III Programmatic Early Restoration Plan. As described there, potential projects evolve from public scoping, ongoing public input through internet-accessible databases, review of current Federal and State management plans and programs, and Trustee expertise and experience. From this broad list of project ideas, the Trustee's Early Restoration project selection process initially results in a set of proposed projects that, consistent with the Framework Agreement, are submitted to BP for review and consideration. One area considered for Early Restoration included restoration for injured pelagic fish resources, and in particular, focusing on reduction in pelagic longline bycatch as an approach to restore lost pelagic fish biomass.

During the Phase IV Early Restoration project development process, the Trustees considered an alternative project component that provided for the exchange of PLL vessels for vessels specifically suited to the use of alternative gears. Under this alternative, vessel owners would have retained their current permits to allow for use of alternative gears and would have been able to utilize the new vessels for PLL fishing beyond the repose period in accordance with their project participation agreements. Through the Early Restoration project selection process, this alternative proved to be infeasible in the context of the Framework Agreement. The Trustees also considered the alternative of implementing a vessel buy-out program for pelagic longline vessels. Such a buy-out program would reduce the fishing mortality in the GOM PLL fishery by purchasing active PLL vessels and the limited access permits needed to fish PLL from willing sellers. Under this alternative, vessels would be removed from the U.S. Atlantic PLL fishery and scrapped to prevent reentry to the fishery. In addition, the associated limited access permits would be terminated to prevent reentry to the U.S. Atlantic PLL fishery. This alternative would permanently remove fishing vessels from the PLL fishery. This alternative was compared to criteria under the NRDA regulations including the feasibility, cost, benefits to other species, and likelihood of success. The vessel buy-out alternative was ultimately not brought forward for Early Restoration because the Trustees considered it to be less feasible due to the potential for long-term impacts to management of HMS fisheries when compared to the proposed alternative, and as less optimal to achieving project success through Early Restoration when compared to the proposed alternative of an annual 6-month repose and provisioning of alternative fishing gears.

14.2.4 Project Location

The project area consists of the offshore marine environment as described in Chapter 3.2.2.2 (Coastal Water Environment) of the Final Phase III ERP/PEIS and more specifically the pelagic, oceanic waters of the GOM EEZ (Figure 14-5) as well as those ports associated with landings of catch by PLL gear (Figure 14-6).

Figure 14-5. Proposed PLL Project location is the U.S. Exclusive Economic Zone (EEZ) in the Gulf of Mexico indicated by the shaded area



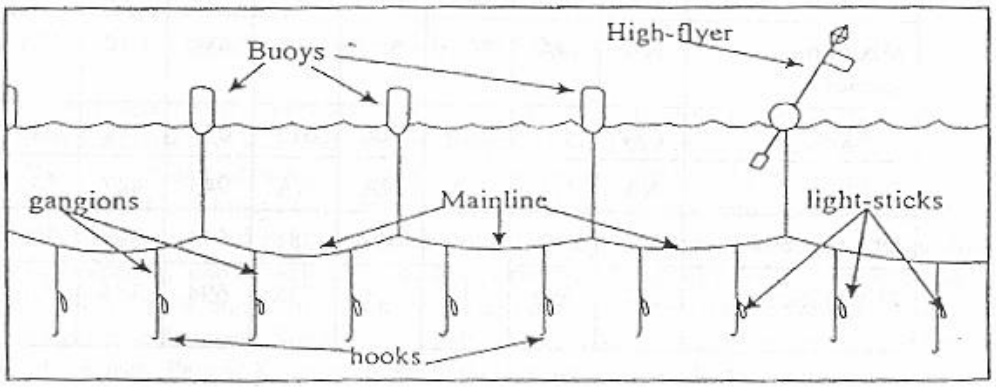
14.2.5 Project Scope

14.2.5.1 Atlantic Pelagic Longline Fishery (including Gulf of Mexico)

The U.S. Atlantic PLL fishery (as described in Section 14.2.1.2 above) primarily targets swordfish, yellowfin tuna, and bigeye tuna in various areas and season, but has secondary target species as well and is generally a multi-species fishery. PLL gear sometimes hooks non-target finfish that cannot be retained under fishery regulations, and the gear may also interact with protected species such as marine mammals, sea turtles, and seabirds. Thus, this gear has been classified as a Category I fishery in the List of Fisheries (LOF), which fulfills the mandate of classifying each fishery by the level of serious injury and mortality of marine mammals under the Marine Mammal Protection Act (http://www.nmfs.noaa.gov/pr/interactions/lof/). Any species that cannot be landed under fishery

regulations (or undersized catch of permitted species) is required to be released, regardless of whether the catch is dead or alive.

Figure 14-6. Typical U.S. Pelagic Longline Gear



Source: As referenced in the NOAA/NMFS SAFE Report for Atlantic Highly Migratory Species 2011 (http://www.nmfs.noaa.gov/sfa/hms/documents/safe_reports/2011/2011_safe_report.html)

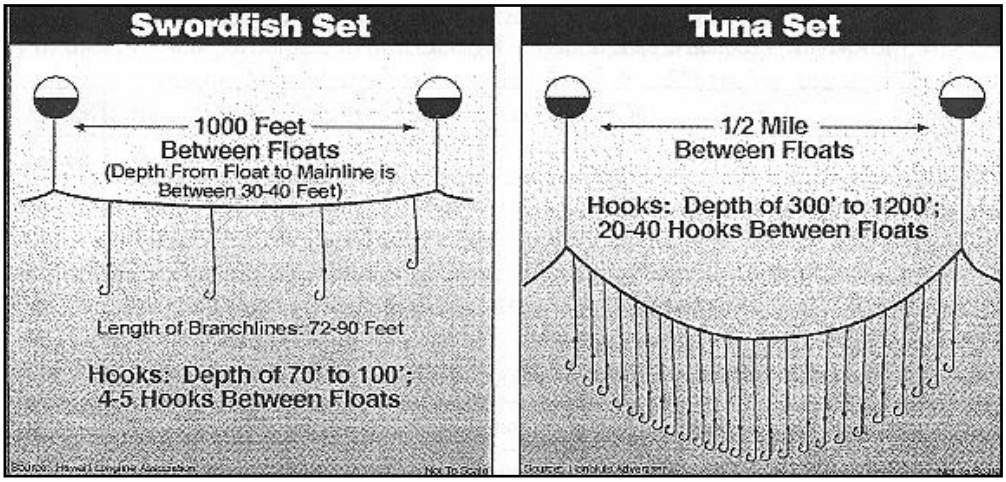
PLL gear is composed of several parts (Figure 14-6). The primary fishing line, or mainline of the longline system, can vary from five to 40 miles in length, with approximately 20 to 30 hooks per mile. The depth of the mainline is determined by ocean currents and the length of the floatline, which connects the mainline to several buoys, and periodic markers which can have radar reflectors or radio beacons attached. Each individual hook is connected by a leader, or gangion, to the mainline. Lightsticks, which contain light emitting chemicals, are often used, particularly when targeting swordfish. When attached to the hook and suspended at a certain depth, lightsticks attract baitfish, which may, in turn, attract pelagic predators (NMFS 1999).

When targeting swordfish, PLL gear is generally deployed at sunset and hauled at sunrise to take advantage of swordfish nocturnal near-surface feeding habits (NMFS 1999). In general, longlines targeting tunas are set in the morning, fished deeper in the water column, and hauled back in the evening. Except for vessels of the distant water fleet, which undertake extended trips, fishing vessels preferentially target swordfish during periods when the moon is full to take advantage of increased densities of pelagic species near the surface.

Figure 14-7 illustrates basic differences between swordfish (shallow) and tuna (deep) longline sets. Swordfish sets are buoyed to the surface, have fewer hooks between floats, and are relatively shallow. This same type of gear arrangement is used for mixed target species sets. Tuna sets use a different type of float placed much further apart. Compared with swordfish sets, tuna sets have more hooks between the floats and the hooks are set much deeper in the water column. It is believed that tuna sets hook fewer turtles than the swordfish sets because of the difference in fishing depth. In addition, tuna sets use bait only, while swordfish sets use a combination of bait and lightsticks. Compared with vessels

targeting swordfish or mixed species, vessels specifically targeting tuna are typically smaller and fish different grounds.

Figure 14-7. Longline Gear Deployment Techniques



Note: This figure is included only to show basic differences in pelagic longline gear configuration and to illustrate that this gear may be altered to target different species. Source: Hawaii Longline Association and Honolulu Advertiser.

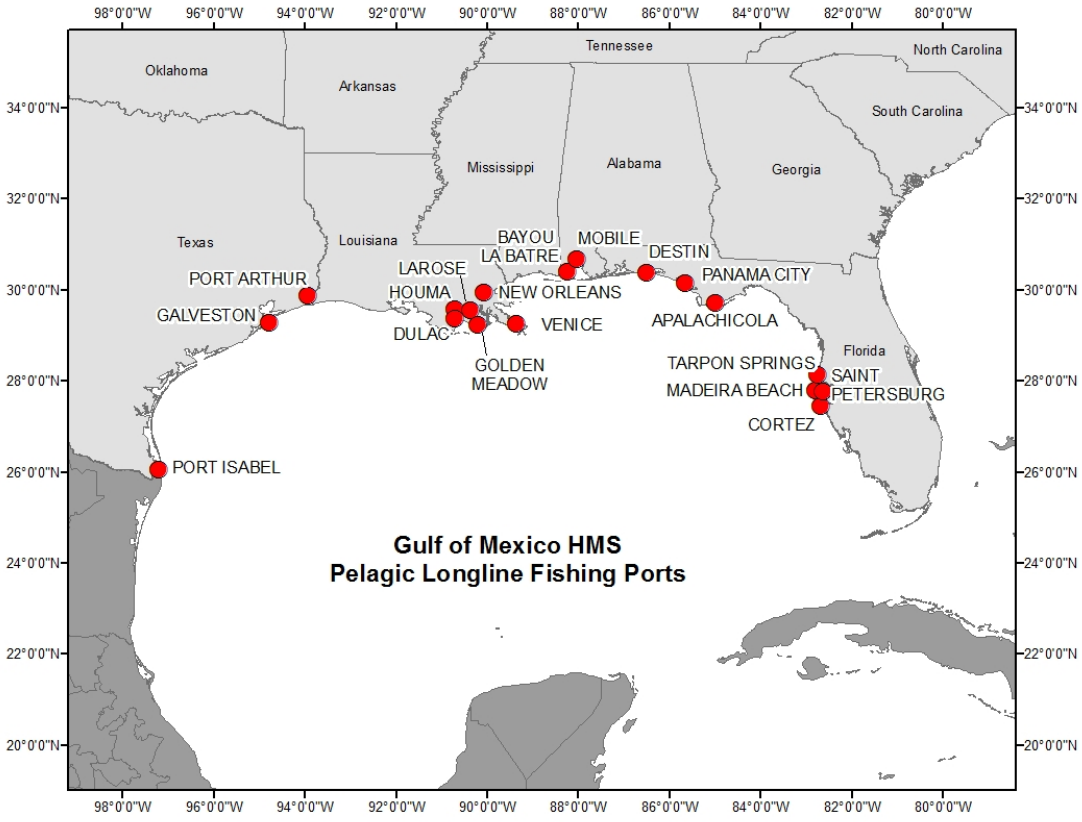
The U.S. Atlantic PLL fishery has historically been comprised of five relatively distinct segments with different fishing practices and strategies. These segments are: 1) the GOM yellowfin tuna fishery; 2) the South Atlantic-Florida east coast to Cape Hatteras swordfish fishery; 3) the Mid-Atlantic and New England swordfish and bigeye tuna fishery; 4) the U.S. distant water swordfish fishery; and, 5) the Caribbean Islands tuna and swordfish fishery. Each vessel type has different range capabilities due to fuel capacity, hold capacity, size, and construction. In addition to geographical area, these segments have historically differed by percentage of various target and non-target species, gear characteristics, and deployment techniques. Some vessels fish in more than one fishery segment during the course of a year (NMFS 1999). Due to the various changes in the fishery, (i.e., regulations, operating costs, market conditions, species availability, etc.), the fishing practices and strategies of these different segments may change over time. Because the scope of the proposed action is primarily within the GOM, the regional description of the GOM PLL fishery, which primarily targets yellowfin tuna, is further developed below.

14.2.5.1.1 The Gulf of Mexico Yellowfin Tuna Fishery

GOM vessels primarily target yellowfin tuna year-round; however, a handful of these vessels directly target swordfish, either seasonally or year-round. Longline fishing vessels that target yellowfin tuna in the GOM also catch and sell dolphin (mahi), swordfish, other tunas, and sharks. During yellowfin tuna fishing, few swordfish are captured incidentally. Many of these vessels participate in other GOM fisheries (targeting shrimp, shark, and snapper/grouper) during allowed seasons.

For catching tuna, the longline gear is configured similarly to swordfish longline gear but is deployed differently. The gear is typically set in the morning (between two a.m. and noon) and retrieved in the evening or night (4 p.m. to midnight). Fishing occurs in varying water temperatures; however, yellowfin tuna are generally targeted in the western GOM during the summer when water temperatures are high. In the past, fishermen have used live bait, however, NMFS prohibited the use of live bait in the GOM in an effort to decrease bycatch and bycatch mortality of billfish (65 FR 47214, August 1, 2000). This rule also closed the Desoto Canyon area (year-round closure) to PLL gear. In the GOM, and all other areas, except the Northeast Distant waters (NED), specific circle hooks (16/0 or larger non-offset and 18/0 or larger with an offset not to exceed 10 degrees) are currently required, as are whole finfish and squid baits. In 2011, NMFS implemented a requirement for PLL vessels fishing in the GOM to use "weak hooks" that are designed to release spawning bluefin tuna (BFT) while retaining yellowfin tuna and swordfish (76 FR 18653, April 5, 2011). This action provides protection for spawning BFT in the GOM and helps to better align landings and dead discards of BFT with the Longline category BFT subquota. Figure 14-8 shows the HMS PLL fishing ports in the GOM.

Figure 14-8. HMS Pelagic Longline Fishing Ports in the Gulf of Mexico 2006 - 2012



Source: HMS logbooks.

14.2.5.1.2 Fishing Permits for PLL

The 1999 FMP) for Atlantic Tunas, Swordfish, and Sharks established six different limited access permit (LAP) types: (1) directed swordfish, (2) incidental swordfish, (3) swordfish handgear, (4) directed shark, (5) incidental shark, and (6) Atlantic tunas longline (NMFS 1999). To reduce bycatch in the U.S. Atlantic PLL fishery, these permits were designed so that the swordfish directed and incidental permits are valid only if the permit holder also holds both a tuna longline and a shark permit. Similarly, the tuna longline permit is valid only if the permit holder also holds both a swordfish (directed or incidental, not handgear) and a shark permit. This allows limited retention of species that might otherwise have been discarded.

As of November 2014, approximately 246 tuna longline LAPs had been issued. In addition, approximately 183 directed swordfish LAPs, 66 incidental swordfish LAPs, 206 directed shark LAPs, and 258 incidental shark LAPs had been issued. Not all vessels with limited access swordfish and shark permits use PLL gear, but these are the only permits ((1) tuna longline; (2) shark LAP; and, (3) swordfish LAP (other than handgear)) that allow for the use of PLL gear in HMS fisheries.

On December 2, 2014, NMFS announced the final rule to implement Amendment 7 to the 2006 Consolidated HMS FMP. This action was necessary to meet domestic management objectives under the MSFCMA including preventing overfishing, achieving optimum yield, and minimizing bycatch to the extent practicable, as well as the objectives of Atlantic Tuna Conservation Act (ATCA) and obligations pursuant to binding recommendations of the International Commission for the Conservation of Atlantic Tunas (ICCAT). ICCAT is responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and adjacent seas. ICCAT is an international body that conducts scientific research and sets catch levels for participating countries. Amendment 7 is intended to reduce and account for bluefin tuna dead discards in all categories; optimize fishing opportunities in all categories within the United States' quota; enhance reporting and monitoring; and adjust other management measures as necessary. Most of the management measures in the final rule took effect January 1, 2015, while some measures will take effect on either June 1, 2015, or January 1, 2016. More detailed information regarding this rule is available at http://www.nmfs.noaa.gov/sfa/hms/documents/fmp/am7/index.html.

Recent Catch and Landings

The reported catch, in numbers of fish, is summarized for the whole U.S. Atlantic PLL fishery in Table 14-5. Table 14-6 provides a summary of U.S. Atlantic PLL landings by weight, as reported to the International Commission for the Conservation of Atlantic Tunas (ICCAT).

Table 14-5. Catch Reported in the U.S. Atlantic Pelagic Longline Fishery, in Number of Fish per Species (2004-2013)

Species	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Swordfish kept	46,440	41,139	38,241	45,933	42,800	45,378	33,831	38,721	51,544	44,556
Swordfish discarded	10,675	11,134	8,900	11,823	11,194	7,484	6,107	8,736	7,996	4,756
Blue marlin discarded	712	567	439	611	687	1,013	504	544	896	844

Species	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
White marlin discarded	1,053	989	557	744	670	1,064	605	943	1,432	1,239
Sailfish discarded	424	367	277	321	506	774	312	581	795	456
Spearfish discarded	172	150	142	147	197	335	212	281	270	342
Bluefin tuna kept	475	375	261	337	343	629	392	347	392	273
Bluefin tuna discarded	1,031	765	833	1,345	1,417	1,290	1,488	765	563	266
Bigeye, albacore, yellowfin, and skipjack tunas kept	76,962	57,132	73,058	70,390	50,108	57,461	51,786	69,504	84,707	67,083
Pelagic sharks kept	3,440	3,149	2,098	3,504	3,500	3,060	3,872	3,732	2,794	3,384
Pelagic sharks discarded	25,355	21,550	24,113	27,478	28,786	33,721	45,511	43,806	23,038	28,151
Large coastal sharks kept	2,292	3,362	1,768	546	115	403	434	131	86	49
Large coastal sharks discarded	5,230	5,877	5,326	7,133	6,732	6,672	6,726	6,351	7,716	7,997
Dolphin kept	38,769	25,707	25,658	68,124	43,511	62,701	30,454	30,054	42,445	34,250
Wahoo kept	4,633	3,348	3,608	3,073	2,571	2,648	749	1,922	3,121	2,721
Sea turtle interactions	369	152	128	300	476	137	94	66	61	92
Number of Hooks (× 1,000)	7,276	5,911	5,662	6,291	6,498	6,979	5,729	6,035	7,679	7,306

Source: Fisheries Logbook System.

Table 14-6. Reported Landings (mt ww) in the U.S. Atlantic Pelagic Longline Fishery (2004-2013)

Species	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Yellowfin tuna	2,492.2	1,746.2	2,009.9	2,394.5	1,324.5	1,700.1	1,188.8	1,458.3	2,281.0	1,543.5
Skipjack tuna	0.7	0.6	0.2	0.02	1.45	0.5	1.4	0.6	0.4	0.4
Bigeye tuna	310.1	311.9	520.6	380.7	407.7	430.1	443.2	600.2	583.2	508.4
Bluefin tuna*	180.1	211.5	204.6	164.3	232.6	335.0	238.7	241.4	291.9	190.4
Albacore tuna	120.4	108.5	102.9	126.8	126.5	158.3	159.9	240.0	261.4	255.8
Swordfish N.*	2,518.5	2,272.8	1,960.8	2,474.0	2,353.6	2,691.3	2,206.2	2,570.9	3,384.5	2,823.1
Swordfish S.*	15.7	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.06

* Includes landings and estimated discards from scientific observer and logbook sampling programs. Source: NMFS 2014b.

14.2.5.1.3 Greenstick Gear

Greenstick gear is defined at 50 CFR § 635.2 as "an actively trolled mainline attached to a vessel and elevated or suspended above the surface of the water with no more than 10 hooks or gangions attached to the mainline. The suspended line, attached gangions and/or hooks, and catch may be retrieved

collectively by hand or mechanical means. Greenstick does not constitute a pelagic longline or a bottom longline as defined in this section or as described at §635.21(c) or §635.21(d), respectively." Greenstick gear may be used to harvest bigeye, northern albacore, yellowfin, and skipjack tunas (collectively referred to as BAYS tunas) and bluefin tuna (where not otherwise prohibited) aboard Atlantic tunas General category, HMS Charter/Headboat, and Atlantic tunas Longline permitted vessels.

Onboard Atlantic tunas Longline permitted vessels, up to 20 J-hooks may be possessed for use with greenstick gear and no more than 10 J-hooks may be used with a single greenstick gear. J-hooks may not be used with PLL gear and no J-hooks may be possessed onboard a PLL vessel unless greenstick gear is also onboard. J-hooks possessed and used onboard PLL vessels may be no smaller than 1.5 inch (38.1 mm) when measured in a straight line over the longest distance from the eye to any other part of the hook.

Recent Catch and Landings

Greenstick gear has been used in the Atlantic tuna fisheries since the mid-1990s. Reporting mechanisms that are in place do not enable the number of vessels using greenstick gear to be quantified; although, limited data allow the catch to be characterized and were presented in the 2008 SAFE Report (NMFS, 2008b). Data on landings specific to greenstick gear are expected to improve because a greenstick gear code was designated for use in dealer reporting systems such as trip tickets in the southeast and electronic reporting programs in the northeast. NMFS has, with some success, also encouraged states to utilize the greenstick gear code in their trip ticket programs. In 2009, the States of South Carolina, Louisiana, and Texas indicated that they would add a greenstick gear code to their trip ticket programs and Florida confirmed that the code has been added to their program. Beginning in 2013, the HMS e-Dealer electronic reporting system was required to be used by Atlantic HMS dealers and Table 14-7 shows greenstick landings data from this system.

Table 14-7. Select Landings with Greenstick Gear (2013)

Species	Region	Pounds (whole weight)
Yellowfin tuna	Atlantic	43,175
	Gulf of Mexico	19,212

Additional landings of other species occurred in 2013, but cannot be displayed due to confidentiality requirements. Source: Atlantic HMS Electronic Dealer Reporting System.

NMFS and the Louisiana Department of Wildlife and Fisheries continue to investigate the catch and bycatch of greenstick gear with a study in the northern GOM that is funded by the NOAA Bycatch Reduction Engineering Program. Sampling began in summer 2012 and is scheduled to continue through 2015 with a final report expected in late 2015.

14.2.5.1.4 Buoy Gear

Buoy gear means a fishing gear consisting of one or more floatation devices supporting a single mainline to which no more than two hooks or gangions are attached. The buoy gear fishing usually occurs at night. Authorized permit holders may not possess or deploy more than 35 floatation devices and may not deploy more than 35 individual buoy gears per vessel. Buoy gear must be constructed and deployed so that the hooks and/or gangions are attached to the vertical portion of the mainline. Floatation devices may be attached to one, but not both ends of the mainline, and no hooks or gangions may be attached to any floatation device or horizontal portion of the mainline. If more than one floatation device is attached to a buoy gear, no hook or gangion may be attached to the mainline between them. Individual buoy gears may not be linked, clipped, or connected together in any way. Buoy gears must be released and retrieved by hand. All deployed buoy gear must have some type of monitoring equipment affixed to it including, but not limited to, radar reflectors, beeper devices, lights, or reflective tape. If only reflective tape is affixed, the vessel deploying the buoy gear must possess on board an operable spotlight capable of illuminating deployed floatation devices. If a gear monitoring device is positively buoyant, and rigged to be attached to a fishing gear, it is included in the 35 floatation device vessel limit and must be marked appropriately.

Recent Catch, Landings, and Discards

2008 through 2013 buoy gear effort and catch data are provided in Table 14-8, Table 14-9, and Table 14-10. Buoy gear effort and catch data prior to 2008 may be found in earlier SAFE Reports. Prior to 2007, buoy gear catch data were included in handline catch data. Historically, the majority of buoy gear effort (approximately 95% according to NMFS Atlantic HMS logbook data), occurs in the Straits of Florida and thus has not been a prominent gear used in the GOM.

Table 14-8. Buoy Gear Effort (2008-2013)

Specifications	2008	2009	2010	2011	2012	2013
Number of vessels	44	53	57	50	55	46
Number of trips	598	708	632	603	688	629
Average buoy gears deployed per trip	11.2	11.9	11.9	12.2	14.1	17.95
Total number of set hooks	8,922	11,595	8,855	8,858	11,639	12,557
Average number hooks per gear	1.3	1.4	1.2	1.2	1.2	1.1

Source: Fisheries Logbook System.

Table 14-9. Buoy Gear Landings (pounds dressed weight (lb dw), 2008-2013)

Species	2008	2009	2010	2011	2012	2013
Swordfish	122,700	154,674	153,520	138,041	178,088	140,038
Dolphin	1,031	1,427	419	1,269	1,324	486
Oilfish	414	245	270	338	719	693
Shortfin mako shark	797	932	466	812	2,295	1,194
Wahoo	227	623	75	198	163	70
Bigeye tuna	0	0	0	350	0	0
Blacktip shark	0	0	0	0	38	0
King mackerel	194	67	576	142	56	134
Yellowfin tuna	0	350	0	400	0	0
Hammerhead shark	0	350	1,190	575	400	0
Silky shark	0	20	48	0	120	0
Greater amberjack	0	10	201	0	0	0
Bonito	0	86	120	0	54	0
Blackfin tuna	0	0	115	70	97	32

Source: Fisheries Logbook System.

Table 14-10. Buoy Gear Catches and Discards, in Numbers of Fish per Species (2008-2013)

Species	2008	2009	2010	2011	2012	2013
Kept						
Swordfish	1,843	2,085	1,950	1,893	2,699	2,155
Dolphinfish	103	113	29	121	196	51
Oilfish	10	5	10	76	13	18
Bigeye tuna	0	0	0	4	0	0
Blackfin tuna	7	2	7	3	10	3
Wahoo	6	44	2	40	12	2
Bonito	7	11	6	0	1	0
King mackerel	53	4	7	130	2	14
Shortfin mako	4	8	4	7	14	13
Hammerhead shark	0	1	6	3	3	0
Blacktip shark	0	0	0	0	1	0
Silky shark	1	1	1	0	4	0
Yellowfin tuna	0	9	0	8	0	0
Greater amberjack	0	1	7	0	0	0
Thresher shark	0	0	0	0	1	0
Released Alive						
Swordfish	1,018	763	1,031	1,659	1,221	478
Dolphinfish	0	0	0	11	14	4
Blue marlin	0	1	1	2	2	1
White marlin	3	0	0	0	0	0
Sailfish	1	0	1	1	0	0
Hammerhead shark	7	35	52	81	93	68
Blue shark	2	1	0	30	5	0

Species	2008	2009	2010	2011	2012	2013
Thresher shark	1	1	2	7	6	1
Dusky shark	0	0	12	2	9	97
Night shark	1	34	39	87	238	129
Oceanic whitetip shark	1	0	0	0	0	1
Bigeye thresher shark	0	0	0	2	2	1
Tiger shark	2	1	1	2	2	3
Sandbar shark	0	1	2	0	0	0
Longfin mako shark	3	2	7	5	6	4
Shortfin mako shark	1	2	6	4	5	6
Blacktip shark	0	8	4	19	39	11
Silky shark	0	13	12	14	12	33
Oilfish	0	1	0	1	0	0
Greater amberjack	0	1	0	0	0	0
Blackfin Tuna	0	0	0	3	0	0
Skipjack Tuna	0	0	0	1	0	0
Discarded Dead						
Swordfish	80	51	87	155	139	75
Silky shark	0	0	0	0	0	0
Hammerhead shark	0	0	1	1	0	0
Blackfin tuna	0	1	0	1	0	0
Blue marlin	0	1	0	0	0	0
Night shark	0	0	1	0	1	2
Longfin mako shark	0	0	0	0	1	0
Shortfin Mako	0	0	0	1	0	0

Source: Fisheries Logbook System.

14.2.5.2 Summary of PLL Project Scope

The GOM PLL fishery is a multi-species fishery, with operators acting opportunistically to make gear or other subtle changes, within existing regulations, to target the most economically valuable species authorized by the permits held by the vessel. PLL gear also results in bycatch of non-targeted finfish which are not retained due to regulations or limited economic value, as well as protected species such as marine mammals and sea turtles. This proposed PLL Project would help reduce fish mortality from bycatch in the U.S. Atlantic PLL fishery operating in the GOM as well as restore pelagic fish biomass injured as of result of the *Deepwater Horizon* Spill. These actions would improve resource sustainability through the PLL repose period while still allowing PLL fishers the opportunity to fish with greenstick and/or buoy gear.

14.2.6 Affected Environment and Environmental Consequences

NEPA directs federal agencies to consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

In order to determine whether an action has the potential to result in significant impacts, the **context and intensity** of the action must be considered. **Context** refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). **Intensity** refers to the severity of impact and could include the timing of the action (e.g., more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing, etc.). Intensity is also described in terms of whether the impact would be beneficial or adverse.

For purposes of this document, impacts are characterized as minor, moderate or major, and temporary or long-term. The analysis of beneficial impacts focuses on the duration (short- or long-term), without attempting to specify the intensity of the benefit. The definition of these characterizations is consistent with that used in the Final Phase III ERP/PEIS, and can be found in Appendix D.

According to the CEQ Regulations for Implementing NEPA (Section 1502.1 and 1502.2) agencies should "focus on significant environmental issues" and for other than significant issues there should be "only enough discussion to show why more study is not warranted." After preliminary investigation, some resource areas were determined to be either unaffected or minimally affected by the proposed action. These resources are not discussed in further detail below. Only those resource areas with potential, adverse impacts are discussed in detail below. Additionally, throughout the project design process, every practical attempt will be made to avoid and minimize potentially adverse environmental, social, and cultural impacts. BMPs generated from reviews of the environmental consequences of this project will be adhered to during project implementation to minimize impacts to resources.

The programmatic analysis in the Final Phase III ERP/PEIS looked at a series of resources as part of the biological, physical, and socioeconomic environment. As appropriate in a tiered analysis, the evaluation of each project focuses on the specific resources with a potential to be affected by the proposed project. To avoid redundant or unnecessary information, resources that are not expected to be affected are not evaluated further under a given project. After preliminary investigation, the following resource areas were determined to be either unaffected or minimally affected by the proposed PLL Project actions.

- Geology and substrates: The proposed action would not involve disturbance or impact to geology or substrates in the GOM. No construction or physical change to the environment would result from implementation of the proposed project.
- Aesthetics and visual resources: The proposed action would not involve disturbance or change to the aesthetics of the GOM. Implementation of the project affects the timing of an existing PLL fishing activity only and would result in no change to the visual resources.
- Infrastructure: The proposed action would not involve any change to existing infrastructure in the GOM. No additional shore-side support is required. The level of activity at any port would not be measurably different from the current activity that would otherwise necessitate a change in port infrastructure.
- Public health and safety and shoreline protection: The proposed action would not affect health and safety. Vessels participating with the provisioned alternative fishing gears would independently elect when to fish during the fishing season. No requirements are placed on

participating vessels that would result in a necessity to fish at times of risk. No construction would occur as a result of the proposed action hence, no change to shoreline protection would result.

These above resource areas are not expected to be affected by the proposed PLL Project as they are either not connected or are very minimally connected physically, and/or are unrelated due to the nature of the project (i.e., project implementation versus a construction-related activity) and its two integrated actions. Only those resource areas with potential adverse impacts are discussed in detail below.

14.2.6.1 Physical Environment

HMS may be found in large expanses of the world's oceans, straddling jurisdictional boundaries. Although many of the species frequent other oceans of the world, the scope of the U.S. management of Atlantic HMS is in Federal, state or territorial waters, including areas of the U.S. Caribbean, the GOM and the Atlantic coast of the United States to the seaward limit of the U.S. EEZ. These areas are connected by currents and water patterns that influence the occurrence of HMS at particular times of the year. On the largest scale, the North and South Equatorial currents occur in the U.S. Caribbean islands. The North Equatorial Current continues through the Caribbean Basin to enter the GOM through the Yucatan Straits. The current continues through the Florida Straits to join the other water masses (including the Antilles Current) to form the Gulf Stream along the eastern coast of the United States. Variations in flow capacities of the Florida Straits and the Yucatan Straits produce the Loop Current, the major hydrographic feature of the GOM. These water movements in large part influence the distributions of the pelagic life stages of HMS.

Tuna, swordfish, billfish, and some shark species distributions are most frequently associated with hydrographic features such as density fronts between different water masses. The scales of these features may vary. For example, the river plume of the Mississippi River extends for miles into the GOM and is a fairly predictable feature, depending on the season. Fronts that set up over the DeSoto Canyon in the GOM, or over the Charleston Bump or the Baltimore Canyon in the Mid-Atlantic, may be of a much smaller scale. The locations of many fronts or frontal features are statistically consistent within broad geographic boundaries. These locations are influenced by riverine inputs, movement of water masses, and the presence of topographic structures underlying the water column, thereby influencing the habitat of HMS. For a detailed description of HMS coastal, continental shelf, and slope area habitats of the Atlantic, GOM, and U.S. Caribbean, please refer to Section 3.3.2 of the 2006 Consolidated HMS FMP or Amendment 1 to the 2006 Consolidated HMS FMP (NMFS 2009).

14.2.6.1.1 Hydrology and Water Quality

Affected Environment

The project area consists of the offshore marine environment as described in Chapter 3.2.2.2 of the Final Phase III ERP/PEIS and more specifically pelagic waters of the EEZ.

Environmental Consequences

Sections 6.3.7.2 and 6.7.2.1 of the Phase III ERP PEIS describe the impacts to water quality and hydrology from Early Restoration projects intended to restore and protect finfish and shellfish. For this project, impacts to hydrology and water quality associated with potential actions (including the no action alternative) were adequately analyzed within the PEIS. Potential effects for the proposed PLL project primarily stem from vessels that would fish in the GOM.

No Action

This alternative would not increase or decrease the number of fishing vessels using PLL gear, greenstick or buoy gear and would have no effect on hydrology and water quality resources.

Proposed Action

Temporary reductions in fishing and implementation of methods such as use of the proposed alternative gears to reduce bycatch mortality could have short-term beneficial effects on water quality by temporarily reducing the number of vessels on the water. However, vessels participating in the PLL repose may fish with greenstick and buoy gear during the repose, which could result in no net reduction in the number of vessels on the water. Depending on the types and size of vessels that participate in the project, a reduction in the contaminant loadings to surface waters typical of those vessels may or may not occur. Vessels may be used for purposes other than fishing during the repose. Regardless, these effects would be minor and short-term because they would be small, localized, and only occur when vessels are not being used for fishing.

14.2.6.1.2 Air Quality and Greenhouse Gas Emissions

Affected Environment

The project area consists of the offshore marine environment as described in Chapter 3.2.3 of the Final Phase III ERP/PEIS and more specifically pelagic waters of the EEZ.

Environmental Consequences

Sections 6.3.7.2 and 6.7.3.1 of the Phase III ERP PEIS describe the impacts to air quality and greenhouse gas emissions from Early Restoration projects intended to restore and protect finfish and shellfish. For this project, impacts to air quality and greenhouse gas emissions associated with potential actions (including the no action alternative) were adequately analyzed within the PEIS. Potential effects for the proposed PLL project primarily stem from vessels that would fish in the GOM.

No Action

This alternative would not increase or decrease the number of fishing vessels using PLL gear, greenstick or buoy gear and would have no effect on air quality and greenhouse gas emissions.

Proposed Action

Temporary reductions in fishing effort and implementation of methods to reduce bycatch mortality such as use of the proposed alternative gears could have short-term beneficial effects on air quality and greenhouse gas emissions by temporarily reducing the number of vessels on the water. However, vessels participating in the PLL repose may fish with greenstick and buoy gear during the repose, which could result in no net reduction in the number of vessels on the water. Depending on the types and size of vessels that participate in the project, a reduction in the emissions typical of those vessels may or may not occur. Vessels may be used for purposes other than fishing during the repose. Regardless, these effects would be minor and short-term because they would be small, localized, and only occur when vessels are not being used for fishing.

14.2.6.1.3 Noise

Affected Environment

The project area consists of the offshore marine environment as described in Chapter 3.2.4 of the Final Phase III ERP/PEIS and more specifically pelagic waters of the EEZ. The primary sources of ambient (background) noise in the project area, both above and below the water's surface, are natural sounds such as wind, wave action and wildlife (including vertebrate and invertebrate aquatic marine organisms). Limited ambient noise is sourced from humans or human activities in the offshore marine environment. Those noises that are derived from humans include commercial and recreational vessels, marine transportation vessels or commercial platforms such as oil and gas rigs. These noises derived from humans occur both above and below the water's surface, for example, engines in motorized vessels may produce noise above the water because a portion or portions of the vessel and engine system may be located above the water's surface. These engine noises may also occur below the water's surface due to the vessel hull/water interface through which sound waves from the engine can be transferred into the water. Another example related to oil and gas oil platforms is where mechanical noises from the operation of the platform and audible navigational warning beacons may cause noise above the water's surface while mechanical movement of the drilling or oil/gas extraction process during operation may cause noises below the water's surface. In the offshore area, these sources are widely dispersed over broad geographic space.

Environmental Consequences

Sections 6.3.7.4 and 6.7.4.1 of the Phase III ERP PEIS describe the impacts to noise from Early Restoration projects intended to restore and protect finfish and shellfish. For this project, impacts to noise associated with potential actions (including the no action alternative) were adequately analyzed within the PEIS. Potential effects for the proposed PLL project primarily stem from vessels that would fish in the GOM.

No Action

This alternative would not increase or decrease the number of fishing vessels using PLL gear, greenstick or buoy gear and would have no effect on noise.

Proposed Action

Temporary reductions in fishing effort and implementation of methods to reduce bycatch mortality such as use of the proposed alternative gears could have short-term beneficial effects on noise by temporarily reducing the number of vessels on the water. However, vessels participating in the PLL repose may fish with greenstick and buoy gear during the repose, which could result in no net reduction in the number of vessels on the water. Depending on the types and size of vessels that participate in the project, a reduction in the noise typical of those vessels may or may not occur. Vessels may be used for purposes other than fishing during the repose. Regardless, these effects would be minor and short-term because they would be small, localized, and only occur when vessels are not being used for fishing.

14.2.6.1.4 Summary of Impacts to the Physical Environment

The adverse impacts to the physical environment from the proposed action (implementation of the project) are overall expected to be minor and short-term in nature. Expected possible small shifts in the number and behavior of vessels may result in subtle noise and air quality and greenhouse gas emission changes from the current operations in the GOM PLL fishery. There is no expected impact from no action or the proposed action on water quality and hydrology.

14.2.6.2 Biological Environment

14.2.6.2.1 Living Coastal and Marine Resources

Affected Environment

The living coastal and marine resource affected environment for the proposed PLL Project encompasses pelagic organisms that live in offshore, oceanic habitats, including, but not limited to, those species described in Section 14.2.6. A broad description of living coastal and marine resources is presented in Section 3.2.2 of the Final Phase III ERP/PEIS. A detailed description of the stock status, life history, and habitat of bluefin tuna (including the Habitat Area of Particular Concern in the GOM) is presented in Final Amendment 7 to the 2006 Consolidated Atlantic HMS FMP (NMFS 2014a), which is incorporated by reference and summarized in Section 14.3.1 and is not repeated here.

More specific to this proposed action, a summary of the status of HMS stocks may be found in the 2014 Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic HMS (NMFS 2014b). This information includes stock assessment information and the current stock status of Atlantic HMS as of November 2014 under both the domestic and international thresholds (e.g., whether a species is considered to be overfished on a domestic, and when appropriate, international level). It is incorporated by reference and summarized in Section 14.3.1.1 and is not repeated here.

Essential Fish Habitat

Essential Fish Habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The habitat in the project area includes the pelagic, oceanic waters of the GOM.

EFH for HMS consists of GOM waters and substrates extending from the US/Mexico border to the boundary between the areas covered by the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council from estuarine waters out to depths of 100 fathoms. These areas are connected by currents and water patterns that influence the occurrence of HMS at particular times of the year. The 2014 SAFE Report includes a history of Atlantic HMS EFH. Electronic maps and downloadable spatial EFH files for HMS and all federally managed species are available on the NMFS EFH Mapper at: http://www.habitat.noaa.gov/protection/efh/habitatmapper.html. EFH for Atlantic HMS is further described in a series of documents listed in Table 14-11 and is not repeated here.

On June 30, 2015, NMFS announced the availability of the Final Atlantic HMS EFH 5-Year Review and intent to initiate an amendment to the 2006 Consolidated Atlantic HMS FMP to revise Atlantic HMS EFH descriptions and designations. The Final Atlantic HMS EFH 5-Year Review is available at http://www.nmfs.noaa.gov/sfa/hms/documents/2015_final_efh_review.pdf. This document considers data available regarding Atlantic HMS and their habitats that have become available since 2009.

Table 14-11. Publications with the most recent Atlantic HMS EFH descriptions

Fisheries Management Plan or Amendment	EFH and Species
2006 Consolidated Atlantic HMS FMP	Comprehensive review of EFH for all HMS. EFH for all Atlantic HMS consolidated into one FMP; no changes to EFH descriptions or boundaries
2009 Amendment 1 to the 2006 Consolidated Atlantic HMS FMP	EFH updated for all federally managed Atlantic HMS. Habitat Area of Particular Concern (HAPC) for bluefin tuna spawning area designated in the Gulf of Mexico
2010 Amendment 3 to the 2006 Consolidated Atlantic HMS FMP	EFH first defined for smoothhound sharks (smooth dogfish, Florida smoothhound, and Gulf smoothhound)
2010 White Marlin/ Roundscale Spearfish Interpretive Rule and Final Action	EFH first defined for roundscale spearfish (same as white marlin EFH designation in Amendment 1 to the 2006 Consolidated Atlantic HMS FMP)

Environmental Consequences

Sections 6.3.7.2 and 6.7.7.2 of the Phase III ERP PEIS describe the impacts to living coastal and marine resources from Early Restoration projects intended to restore and protect finfish and shellfish. For this project, impacts to living coastal and marine resources associated with potential actions (including the

no action alternative) were adequately analyzed within the PEIS. Potential effects of the proposed PLL project primarily stem from reduction in dead discards from the GOM PLL fishery.

No Action

This alternative would not increase or decrease the number of fishing vessels using PLL gear, greenstick or buoy gear and would have no effect on living coastal and marine resources.

Proposed Action

PLL Repose

Under this alternative, the dead discards of targeted and non-targeted species by PLL fishermen (participating voluntarily) would be reduced because PLL vessels would not fish during 6-months of each year of the project. Dead discards occur when fish that are caught, have died on the line and are returned to the sea. Fish may also be returned to the sea because they are smaller than allowable to be retained under applicable regulations, are a species that is prohibited from retention, or are not of sufficient economic value to PLL fishermen. The Trustees anticipate that the proposed PLL Project would have a duration ranging between 5-10 years; however, the actual duration is dependent on the number of fishing vessels participating in the project. The more vessels that participate, the shorter the duration of the project would be. Regardless of duration, the amount of reduction in dead discards resulting from implementation of the PLL repose is anticipated to remain the same.

The reduction in dead discards resulting from the PLL repose would benefit the stocks of the species caught by PLL fishing gear by allowing more fish to remain alive, thus continuing to grow and/or reproduce. This would in turn help to restore for injuries to pelagic fish caused by the Spill. Some stocks of fish caught by PLL fishing gear are overfished and the reduction in dead discards from the PLL repose may help to improve the overall status of these stocks; however, the amount of improvement in stock status is unknown.

Bluefin tuna is one pelagic species among many for which dead discards are anticipated to be reduced under the proposed action. Bluefin tuna catches in the U.S. Atlantic PLL fishery are managed under an Individual Bluefin Tuna Quota (IBQ) system whereby bluefin tuna quota allocated to the Longline Category is issued to qualified individual vessels in the fishery. Separate GOM IBQ and Atlantic IBQ are issued. GOM IBQ may be used in the GOM or the Atlantic, but Atlantic IBQ may not be used in the GOM. Vessels permitted in the Longline Category (Atlantic Tuna Longline permit holders) may fish with pelagic longline gear only if a minimum amount of IBQ established by regulation is issued or transferred to and available on the vessel. All legal-sized dead bluefin tuna caught with longline gear must be retained by the vessel. All dead discards are reported by observers or the vessel operator and all PLL vessels are monitored by camera systems. Bluefin tuna retained or discarded dead (undersized fish) are accounted for under the vessel's IBQ. Specifics of bluefin tuna management in the Longline Category are available in Final Amendment 7 to the 2006 Consolidated Atlantic HMS FMP (79 FR 71510; December 2, 2014; Also available at: http://www.nmfs.noaa.gov/sfa/hms/documents/fmp/am7/index.html).

The Western Atlantic stock of bluefin tuna spawn primarily in the GOM and bluefin tuna are most prevalent in the GOM from around February through June of each year. This period is the most likely time of year for bluefin tuna to be caught by pelagic longline vessels fishing in the GOM. Individual PLL vessel reposes might be applied at any time during the year; however a PLL repose that occurs during the first two calendar year quarters of a year would be more likely to preclude bluefin tuna catches because that is the period of time when bluefin tuna are most prevalent in the GOM. PLL fishing that occurs during quarters 3 and 4 of each year would be less likely to catch bluefin tuna because most bluefin tuna have migrated out of the GOM at that time. The Trustees are interested in public input on the proposed timing for implementation of the PLL repose period (proposed for quarters 1 and 2, January through June of each year) and the proposal to allow vessels participating in the proposed PLL Project to fish with PLL gear during quarters 3 and 4 (July through December).

During the proposed PLL Project, the dead discards of active PLL vessels in the GOM would be reduced via the repose. One indicator of an active GOM PLL vessel is the issuance of GOM IBQ to the vessel. As mentioned above, vessels permitted in the Longline Category may fish with pelagic longline gear only if a minimum amount of IBQ established by regulation is issued to and available on the vessel. Therefore, the presence of available IBQ on a vessel is critical to the ability of dead discards to be reduced by the proposed action relative to no action on that vessel. In other words, a vessel that has available IBQ is eligible to fish with PLL gear and, while fishing, would incur a certain amount of dead discards with PLL gear. Meanwhile, a vessel without available IBQ is ineligible to fish with PLL gear and would not incur dead discards with PLL gear. In order to realize the proposed PLL Project's restoration goals, agreements would be established only with vessels that have available GOM IBQ and, in order to secure the reduction in dead discards for all species necessary under the proposed PLL Project, vessels would agree not to transfer their IBQ, as a condition of project participation (although otherwise allowable under regulations), to any other vessel in the GOM or Atlantic.

Alternative Fishing Gears

During the repose period, vessels participating in the proposed PLL Project would be able to fish with gears other than PLL consistent with existing regulations. Under the proposed action, the Trustees would provision greenstick and buoy gear to PLL vessels that participate in the PLL repose and that have permits allowing use of the gear. Greenstick and buoy gear would be used by these vessels during the repose as alternatives to PLL gear in order to continue harvesting the target species in this fishery, yellowfin tuna and swordfish. Under existing regulations, vessels that do not possess PLL gear onboard may fish inside the PLL gear restricted areas. The Trustees would provide technical extension services related to rigging and fishing with greenstick and buoy gear to help fishermen learn to use the fishing gears. Greenstick would be used during the PLL repose (and at other times) to target tunas other than bluefin tuna.

NOAA research has shown that greenstick gear catch off of North Carolina is low in bycatch (R. Blankinship pers. comm.). The catch from observed greenstick fishing trips off of the North Carolina Outer Banks from 2009-11 was comprised of yellowfin tuna (48%), skipjack tuna (24%), Atlantic bonito

(16%), blackfin tuna (9%), dolphin (mahi, 2%), and other (1%). One sailfish and one undersized bluefin tuna were caught and released alive. No dead discards were observed during the research.

Preliminary research conducted in the GOM by Nova Southeastern University and funded by the National Fish and Wildlife Foundation, Walton Foundation, and Pew Charitable Trusts also found greenstick gear catch to be dominated by yellowfin tuna and bycatch to be low (Kerstetter 2014.).

Buoy gear would be used during the PLL repose (and at other times) to target swordfish. Under current regulations, vessels possessing a valid Swordfish Direct permit in addition to a valid Atlantic Tunas Longline permit would be able to fish with buoy gear. Buoy gear is only authorized for the harvest of swordfish.

Currently in the Atlantic swordfish fishery, buoy gear is primarily used in the Gulf Stream along the Florida Straits and along the Southeast coast of Florida. Research to characterize the Southeast Florida buoy gear fishery indicated that catch-per-unit-effort (CPUE) for catch and bycatch was much higher for swordfish buoy gear than pelagic longline gear (Kerstetter and Bayse 2009). The fishery in Southeast Florida encountered very little bycatch, and the animals that were captured by the gear were almost always alive at gear retrieval and subsequent release.

Preliminary research conducted in the GOM by Nova Southeastern University and funded by the National Fish and Wildlife Foundation, Walton Foundation, and Pew Charitable Trusts also found buoy gear catch to be dominated by swordfish and bycatch to be low (Kerstetter et al. 2014).

The Trustees anticipate that an increase in the use of greenstick and buoy gear during the PLL repose period would occur but also result in lower fishing mortality for targeted and bycatch species than in the GOM PLL fishery. Fishermen that become proficient with the use of greenstick and buoy gear may continue to use these gears to some extent during times outside of the PLL repose period. To the extent these gears replace the use of PLL gear, there is the potential for increased benefits for fish stocks through addition reductions in dead discards.

The Trustees anticipate that the proposed action would result in short-term and long-term benefits to the living coastal marine resources subject to bycatch under normal PLL fishing practices. Short-term benefits are anticipated because living marine resources would remain in the population and continue to grow to maturity and/or contribute to the propagation of future year classes. Long-term benefits are anticipated because of the future generations of living marine resources and population growth that could occur as a result of increased survival of living marine resources that had occurred in the short-term.

Based on reviews of project materials (Spring 2015) in coordination with representatives from NOAA's Habitat Conservation Division (HCD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project proposed for implementation in Phase IV of the DWH Early Restoration Plan is not anticipated to adversely impact EFH identified in the Gulf of Mexico Fishery Management Council's 2005 Generic EFH Amendment or in NMFS 2006 Consolidated Atlantic HMS FMP. This project will not require further EFH evaluation.

14.2.6.2.2 Protected Species

Affected Resources

The protected species affected by the proposed PLL Project encompasses sea turtles, marine mammals, seabirds, sharks, and corals including, but not limited to the species listed in Table 14-12. This section addresses the protected species occurring within the project area. The broader context of the protected species in the Early Restoration area is provided in the Final Phase III ERP/PEIS. As this Phase IV ERP/EA tiers from that programmatic content, that analysis is not repeated here.

The U.S. Fish and Wildlife Service (USFWS) and NOAA National Marine Fisheries Service (NMFS) lists species as threatened or endangered when they meet criteria detailed under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. §1531 et seq.). Section 7(a)(2) of the ESA requires that each federal agency ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of those species. When the action of a federal agency may affect a protected species or its critical habitat, that agency is required to consult with either the NMFS or the USFWS, depending upon the protected species that may be affected. Endangered Species Act Section 7 consultations have been initated and the appropriate recommendations will be incorporated into the project once the consultation is complete.

Table 14-12. Federally protected species with GOM PLL fishery interactions

Common Name	Scientific Name	Federal Status	Habitat
Mammals			
Risso's Dolphin	Grampus griseus	Protected under MMPA	Temperate, tropical, and subtropical waters with depths generally greater than 3,300ft
Bottlenose Dolphin	Tursiops truncatus	Protected under MMPA	Temperate and tropical waters, and range from coastal populations preferring estuaries and bays to offshore populations that inhabit pelagic waters along the continental shelf
Pantropical Spotted Dolphin	Stenella attenuata	Protected under MMPA	Temperate and tropical waters, preferring shallower water during the day (300 to 1000ft) deep, but dive deeper at night to search for prey.
Atlantic Spotted Dolphin	Stenella frontalis	Protected under MMPA	Tropical to warm temperate waters along continental shelf of Atlantic Ocean.
Short-finned Pilot Whale	Globicephala macrorhynchus	Protected under MMPA	Tropical and temperate waters, typically in deeper waters.
Pygmy Sperm Whale	Kogia breviceps	Protected under MMPA	Tropical, subtropical, and temperate waters in oceans and seas worldwide.
Sperm Whale	Physeter macrocephalus	Endangered under ESA; Protected under MMPA	Ice-free waters of world's oceans, at least 3,000 feet in depth.
Killer Whale	Orcinus orca	Protected under MMPA	Most abundant in colder waters, but can be fairly abundant in temperate waters and at lower densities in tropical, subtropical, and offshore waters.
Beaked Whale	Ziphius cavirostris	Protected under MMPA	Temperate, tropical, and subtropical waters in depths of more than 3,300ft.
Reptiles			
Leatherback Sea Turtle	Dermochelys coriacea	Endangered under ESA	Open ocean, coastal waters
Loggerhead Sea Turtle	Caretta caretta	Threatened under ESA (for Northwest Atlantic DPS that occurs in the GOM)	Oceanic waters as juveniles and coastal zones as juveniles and adults.
Kemp's Ridley Turtle	Lepidochelys kempi	Endangered under ESA	Mainly in neritic (nearshore) zone.
Green Turtle	Chelonia mydas	Endangered under ESA for breeding populations in FL; Threatened under ESA for North Atlantic DPS)	Inshore, nearshore waters
Hawksbill Turtle	Eretmochelys imbricata	Endangered under ESA	Most commonly found in coral reef habitat.
Seabirds			
Laughing Gull	Leucophaeus atricilla	Protected under MBTA	Nesting on barrier beaches and estuarine islands.
Parasitic Jaeger	Stercorarius parasiticus	Protected under MBTA	Mainly open ocean, closer to shore and in estuaries during migration. Nests on Arctic tundra.
Pelican brown	Pelecanus occidentalis	Protected under MBTA	Warm weather species, occurs along coasts and on islands.

Note: The species in this table all had interactions with the GOM PLL fishery in one or more years from 2006-2013.

Fishing gear can accidentally capture, injure, and/or kill protected species, which is called an interaction. This includes injuries and/or deaths of species during active fishing (moving gear), fishing gear set in place, and with fishing gear that has been discarded, lost or otherwise no longer used for harvesting fish (i.e.; marine debris). Under the MMPA, the U.S. Atlantic PLL fishery is classified as a Category I fishery, meaning that it has frequent serious injury or mortality to marine mammals. The U.S. Atlantic PLL fishery also has interactions with sea turtles, primarily leatherbacks and loggerheads, though all five species of sea turtles that occur in the GOM are protected under the ESA. Seabirds, which are protected under the MBTA, also have interactions with the U.S. Atlantic PLL fishery.

Marine Mammals

A variety of dolphins and whales have interactions every year with PLL fishing gear in the GOM. The main species with interactions in the GOM (dead, alive, or seriously injured) are Risso's dolphin, Bottlenose dolphin, and the Pantropical spotted dolphin. Table 14-13 provides a summary of estimated marine mammal species interactions in the GOM PLL fishery as well as the total number of estimated interactions with those species in the entire U.S. Atlantic PLL fishery. There are additional species that have interactions with the broader U.S. Atlantic PLL fishery but they are not represented here (including unidentified dolphins and marine mammals).

Table 14-13. Total Estimated Number of Interactions with Marine Mammals in the PLL Fishery (In GOM & Total for U.S. Atlantic, 2006-2013)

Species	Area	2006	2007	2008	2009	2010	2011	2012	2013
Risso's Dolphin	GOM	0	0	0	0	0	3.3	29.9	15.2
	Total	0	8.8	64.5	38.5	8.9	31.2	56.4	23
Bottlenose Dolphin	GOM	0	1.8	0	3.1	0	12.2	15.7	0
	Total	0	12.6	6.2	22.9	15.9	40.5	101	8.1
Pantropical Spotted Dolphin	GOM	0	0	0	26.6	5.1	0	0	8.8
	Total	0	0	0	26.6	5.1	0	0	8.8
Atlantic Spotted Dolphin	GOM	0	0	0	0	0	0.8	0	0
	Total	0	0	0	0	0	0.8	0	0
Pilot Whale (short-finned & unidentified)	GOM	7.1	0	0	0	0	0	0	6.1
	Total	265.1	86.7	108.8	35.7	147	350	252.6	185.7
Beaked Whale	GOM	0	1.5	0	0	0	0	0	0
	Total	0	1.5	6.1	0	0	0	0	11.0
Killer Whale	GOM	0	0	3.4	0	0	0	0	0
	Total	0	0	3.4	0	0	0	0	0
Pygmy Sperm Whale	GOM	0	0	0	0	1.2	0	0	0
	Total	0	0	0	0	1.2	17.0	0	3.6
Sperm Whale	GOM	0	0	1.6	0	0	0	0	0
	Total	0	0	1.6	0	0	0	0	0

Note: Total means total PLL interactions Atlantic-wide fishery including GOM, though only species with interactions in the GOM are listed by name in this table. Interactions include marine mammals released alive, seriously injured, or dead. Sources: Fairfield-Walsh and Garrison, 2007; Fairfield and Garrison, 2008; Garrison, Stokes & Fairfield, 2009; Garrison and Stokes, 2010, 2011, 2012, 2013, 2014.

Sea Turtles

Sea turtles can ingest the hooks of PLL fishing gear, get entangled in the lines, or get hooked on parts of their bodies including their fins. Of all five sea turtle species that occur in the GOM, Leatherbacks have the highest number of interactions in the GOM PLL fishery followed by loggerheads. Interactions with Kemp's ridley, green, and hawksbill sea turtles on PLL gear are very low. Estimated leatherback and loggerhead sea turtles interactions in the GOM PLL fishery are shown in Table 14-14.

Table 14-14. Estimated Number of Leatherback and Loggerhead Sea Turtle Interactions in the PLL Fishery (In GOM & Total for U.S. Atlantic, 2006-2013)

Species	Area	2006	2007	2008	2009	2010	2011	2012	2013
Leatherback Sea Turtle	GOM	109	212	144	93	26	33	250	144
	Total	415	499	381	286	166	239	596	363
Loggerhead Sea Turtle	GOM	17	10	10	38	2	0	56	20
	Total	559	543	770	243	344	438	681	376

Total means total PLL interactions in the U.S. Atlantic-wide fishery including GOM. Interactions include released alive, seriously injured, or dead sea turtles. Source: NMFS 2014b, Tables 4.8 & 4.9.

Seabirds

Seabird interactions occur in the GOM PLL fishery, but at relatively low levels and mainly occur when gear is being set and birds attempt to pull bait off of the hooks. Table 14-15 shows the total observed number of interactions of seabirds with PLL fishing gear in the GOM.

Table 14-15. Observed Seabird Bycatch in the GOM PLL Fishery (2006-2013)

Year	Species	Number observed	Status
2008	Pelican brown	1	alive
2009	Pelican brown	1	dead
2012	Laughing gull	1	dead
2013	Laughing gull	1	dead
	Parasitic jaeger	1	dead

Note: Years not listed did not have any observed seabird bycatch in the GOM PLL fishery. Source: NMFS 2014b, Table 4.11.

Primary protected species bycatch in the GOM PLL fishery

The following four protected species are profiled in more detail as they are four of the most common species that have serious (dead or seriously injured) interactions with the GOM PLL fishery. These species are included in the offsets provided for the proposed PLL Project, as agreed to between the Trustees and BP.

Risso's Dolphin (*Grampus griseus*):

This species is found in groups averaging between 10-30 animals, and are found in temperate, tropical, and subtropical waters with depths generally greater than 3,300ft. They may prefer the habitats on the continental shelf in the GOM. These dolphins mainly feed at night and consume squid, but also feed on fish, krill, and cephalopods. Bycatch in fishing gear (gillnets, longlines, and trawls) is the primary threat to its population. The Northern GOM stock (there are 4 stocks in U.S. waters) is estimated to be about 2,000 animals, with the total estimate in the U.S. being 29,500 to 41,000.

Bottlenose Dolphin (*Tursiops truncates*):

Bottlenose Dolphins are commonly found in groups of 2-15 animals, but have been known to have herds of several hundred in offshore waters. Their preferred habitat is temperate and tropical waters, and range from coastal populations preferring estuaries and bays to offshore populations that inhabit pelagic waters along the continental shelf. They feed on invertebrates, fish, and squid, and forage both as individuals and as a cooperative group. The main threats to this species include incidental injury and mortality from fishing gear, exposure to pollutants and biotoxins, and viral outbreaks.

Pantropical Spotted Dolphin (*Stenella attenuate*):

Pantropical spotted dolphins usually occur in groups of several to one thousand animals. They live in temperate and tropical waters, preferring shallower water during the day (300 to 1000ft) deep, but dive deeper at night to search for prey. Cephalopods and fish are their main source of food. The current population estimate for the Northern GOM is approximately 91,000 individuals. Bycatch in the fishing industry is the main threat to this species.

Leatherback Sea Turtle (*Dermochelys coriacea*):

This species mainly inhabits the offshore open ocean; however, it does use nearshore coastal waters during nesting or feeding. Nesting for this species occurs around the world, with the largest remaining nesting assemblages along the coasts of Northern South America and West Africa. In U.S. waters, minor nesting areas include primarily the Caribbean, including Puerto Rico, U.S. Virgin Islands, and Southeastern Florida from April through November. Their main forage item is jellyfish, which their sharp-edged jaws and pointed tooth-like cusps are perfectly adapted for, as well as the backward-pointing spines in their mouth and throat to hold onto their prey. This species migrates long distances from nesting to feeding areas. The main threats to this species are the incidental capture by the fishing industry, and the harvest of eggs and adults across its range.

Additional Protected Species in the GOM/PLL Project area

Endangered Species Act Section 7 consultations with USFWS and NMFS on this proposed project would be completed prior to implementation of this proposed PLL Project. Appropriate recommendations would be incorporated into the proposed project. Potential impacts to threatened or endangered species and their critical habitat are presented in Table 14-16 and discussed below.

As a result of increased sea turtle interactions in 2001 and 2002, NMFS reinitiated consultation for the U.S. Atlantic PLL fishery and completed a new biological opinion on June 1, 2004. The June 2004 biological opinion concluded that long-term continued operation of the U.S. Atlantic PLL fishery as proposed was not likely to jeopardize the continued existence of loggerhead, green, hawksbill, Kemp's ridley, or olive ridley sea turtles, but was likely to jeopardize the continued existence of leatherback sea turtles. The biological opinion included a Reasonable and Prudent Alternative (RPA) which was adopted and implemented within the U.S. Atlantic PLL fishery, and an Incidental Take Statement (ITS) for 2004 – 2006 combined, and for each subsequent three-year period (NMFS, 2004). Although green, hawksbill, and Kemp's ridley sea turtles occur in the proposed PLL Project area and an ITS and total mortality level for these species was established in the 2004 Biological Opinion, the ITS and total mortality levels have not been exceeded, thus only leatherback and loggerhead sea turtles are discussed further in this document.

On March 31, 2014, NMFS requested reinitiation of Section 7 consultation under the ESA on the U.S. Atlantic PLL fishery. Despite sea turtle takes that were lower than specified in the Incidental Take Statement, leatherback mortality rates and total mortality levels had exceeded the level specified in the RPA in the 2004 biological opinion. Additionally, new information has become available about leatherback and loggerhead sea turtle populations and sea turtle mortality. While the mortality rate measure will be re-evaluated during consultation, the overall ability of the RPA to avoid jeopardy is not affected, and NMFS is continuing to comply with the terms and conditions of the RPA and Reasonable and Prudent Measures RPMs pending completion of consultation. NMFS also has confirmed that there will be no irreversible or irretrievable commitment of resources that would foreclose the formulation or implementation of any reasonable and prudent alternative measures pending completion of consultation, consistent with section 7(d) of the Act.

On August 27, 2014, NMFS published a final rule to list the following 20 coral species as threatened: five in the Caribbean including Florida and the GOM (*Dendrogyra cylindrus, Orbicella annularis, O. faveolata, O. franksi, and Mycetophyllia ferox*); and 15 in the Indo-Pacific (*Acropora globiceps, A. jacquelineae, A. lokani, A. pharaonis, A. retusa, A. rudis, A. speciosa, A. tenella, Anacropora spinosa, Euphyllia paradivisa, Isopora crateriformis, Montipora australiensis, Pavona diffluens, Porites napopora, and Seriatopora aculeata*) (Final Listing Determination – Corals, 50 CFR Part 223, 2014). Additionally, in that August 2014 rule, two species that had been previously listed as threatened (*A. cervicornis* and *A. palmata*) in the Caribbean were found to still warrant listing as threatened. Seven Caribbean species of corals occur within the management area of Atlantic HMS commercial and recreational fisheries which are managed by NMFS's Office of Sustainable Fisheries, HMS Management Division. Therefore, on October 30, 2014, NMFS requested reinitiation of ESA section 7 consultation on the continued operation and use of HMS gear types (bandit gear, bottom longline, buoy gear, handline, and rod and reel) and associated fisheries management actions in the 2006 Consolidated Atlantic HMS FMP and its amendments, and provided supplemental information regarding the newly-listed species for the ongoing consultation for the U.S. Atlantic PLL fishery.

Environmental Consequences

Sections 6.3.7.2 and 6.7.6.2 of the Phase III ERP PEIS describe the impacts to protected species from Early Restoration projects intended to restore and protect finfish and shellfish. For this project, impacts to protected species associated with potential actions (including the no action alternative) were adequately analyzed within the PEIS. Potential effects for the proposed PLL project primarily stem from vessels that would fish in the GOM.

No Action

This alternative would not increase or decrease the number of fishing vessels using PLL gear, greenstick or buoy gear and would have no effect on protected species beyond those already analyzed.

Proposed Action

PLL Repose

Under this alternative, interactions between PLL gear and protected species are likely to decrease because PLL vessels would not fish during 6-months of each year of the project. PLL gear interactions occur when PLL fishing sets catch, either dead or alive, protected species such as marine mammals and sea turtles on their fishing gear sets. NOAA anticipates that the proposed PLL Project would have a duration ranging between 5-10 years; however, the actual duration is dependent on the number of fishing vessels participating in the project. The more vessels that participate, the shorter the duration of the project would be. Regardless of duration, the amount of reduction in PLL gear interactions with protected species is anticipated to remain the same.

The reduction in dead or injured protected species resulting from the PLL repose would benefit the populations of the species unintentionally caught by PLL fishing gear in the GOM, allowing those species, particularly leatherback sea turtles and pantropical spotted, bottlenose, and Risso's dolphins, to have a better chance of continuing to grow and/or reproduce. This would in turn help to minimize further negative impacts on these species that experienced injury caused by the *Deepwater Horizon* Spill.

Alternative Fishing Gears

As described in the discussion of alternative fishing gears in Section 14.3.6.2.1.4 above, vessels participating in the proposed PLL Project would be able to fish with gears other than PLL consistent within existing regulations. Under existing regulations, the Swordfish Directed and Swordfish Incidental permits are valid only if the permit holder also holds an Atlantic Tuna Longline and a Shark Directed or a Shark Incidental permit. Atlantic Tunas Longline permitted vessels are authorized to use greenstick gear to harvest tunas. Vessels that possess a valid Swordfish Directed permit are authorized to use buoy gear to harvest swordfish. Under this alternative, NOAA would provide greenstick and buoy gear to PLL vessels that are participating in the PLL repose and that have permits that allow the use of the gear.

During NOAA research to characterize the greenstick gear catch off of North Carolina no marine mammals, sea turtles, other protected species or sea birds had interactions with either gear type (R. Blankinship pers. comm.).

All handgears and greenstick gear are constantly tended by the fishing vessel and monitored so that there is very little bycatch of unwanted fish and any protected species, bycatch or unmarketable species captured on the alternative fishing gears provided by the project can be dehooked and released quickly with a high chance of post-release survival. These characteristics of handgears and greenstick gear minimize potential adverse impacts to non-target species. The status quo impacts were analyzed in the 2001 Biological Opinion entitled "Reinitiation of Consultations on the Atlantic Highly Migratory Species Fishery Management Plan and its Associated Fisheries", which concluded that the HMS handgear fishery did not jeopardize any endangered species. Further, a 2008 informal consultation determined that authorizing greenstick gear for the harvest of Atlantic tunas was not likely to adversely affect listed species (Memorandum from R. Crabtree to A. Risenhoover dated August 1, 2008). That informal review found that, given that no interactions with ESA-listed species have been documented with greenstick gear, the gear has little to no potential to interact with listed whales, corals, or fish. For sea turtles, greenstick gear could pose a potential bycatch risk; however, effects were considered minimal. Sea turtles do not feed while swimming at a speed fast enough to keep up with the trolled baits. Although it is possible a sea turtle could be snagged (i.e., foul-hooked) if it comes in direct contact with a trolled hook at the surface, it is extremely unlikely. Sea turtles generally rise to the surface of the water, take a fresh breath of air, and then dive back down, thus spending the majority of their time below the surface. Also, the gear is tended as it is fished and can be monitored and maneuvered to avoid any interactions should they appear imminent. Research conducted by Kerstetter and Bayse (2009) to characterize the Southeast Florida buoy gear fishery did not encounter any marine mammals, sea turtles, or seabirds.

Table 14-16. Federally Protected Species Potential Impacts in the Gulf of Mexico

SPECIES /CRITICAL HABITAT	POTENTIAL IMPACTS TO SPECIES/CRITICAL HABITAT	
	PLL Repose	Alternative Fishing Gear
Risso's Dolphin	PLL fishers not fishing with PLL gear have the potential to reduce potential gear interactions with this species.	Project activities not likely to impact dolphins or to impede transitory routes of this species, dolphins are a mobile mammal and project activities would not impede transitory routes.
Bottlenose Dolphin	PLL fishers not fishing with PLL gear have the potential to reduce potential gear interactions with this species.	Project activities not likely to impact dolphins or to impede transitory routes of this species, dolphins are a mobile mammal and project activities would not impede transitory routes.
Pantropical Spotted Dolphin	PLL fishers not fishing with PLL gear have the potential to reduce potential gear interactions with this species.	Project activities not likely to impact dolphins or to impede transitory routes of this species, dolphins are a mobile fish mammal and project activities would not impede transitory routes.
Leatherback Sea Turtle (Dermochelys coriacea)	PLL fishers not fishing with PLL gear have the potential to reduce potential gear interactions with this species.	Although possible, it is extremely unlikely that a sea turtle would be snagged (i.e., foul-hooked) if it comes in direct contact with a trolled hook at the surface. Sea turtles generally rise to the surface of the

SPECIES /CRITICAL HABITAT	POTENTIAL IMPACTS TO SPECIES/CRITICAL HABITAT	
	PLL Repose	Alternative Fishing Gear
		water, take a fresh breath of air, and then dive back down, thus spending the majority of their time below the surface. Also, the gears are tended as they are fished and can be monitored and maneuvered to avoid any interactions should they appear imminent.
Loggerhead Sea Turtle	PLL fishers not fishing with PLL gear have the potential to reduce potential gear interactions with this species.	See description for Leatherback Sea Turtle.
Laughing Gull	PLL fishers not fishing with PLL gear have the potential to reduce potential gear interactions with this species.	Available information that characterizes greenstick and buoy gear catch show no interactions with seabirds.
Parasitic Jaeger	PLL fishers not fishing with PLL gear have the potential to reduce potential gear interactions with this species.	Available information that characterizes greenstick and buoy gear catch show no interactions with seabirds.
Pelican brown	PLL fishers not fishing with PLL gear have the potential to reduce potential gear interactions with this species.	Available information that characterizes greenstick and buoy gear catch show no interactions with seabirds.
Pillar Coral (Dendrogyra cylindrus)	None expected	Corals occur in the project area; however as both greenstick and buoy gear do not come into contact with the ocean floor or any benthic habitats, they are not anticipated to impact the habitat area of the corals, thus there is no expected impact due to project activities.
Lobed Star Coral (Orbicella annularis)	None expected	See description for Pillar Coral.
Mountainous Star Coral (Orbicella faveolata)	None expected	See description for Pillar Coral.
Boulder Star Coral (Orbicella franksi)	None expected	See description for Pillar Coral.
Knobby Cactus Coral (Mycetophyllia ferox)	None expected	See description for Pillar Coral.
Staghorn Coral (Acropora cervicornis)	None expected	See description for Pillar Coral.
Elkhorn Coral (Acropora palmata)	None expected	See description for Pillar Coral.

The Trustees anticipate that an increase in the use of greenstick and buoy gear during the PLL repose period may occur and use of greenstick and buoy gear may also result in lower protected species mortality and serious injury than in the GOM PLL fishery. Fishermen that become proficient with the use of greenstick and buoy gear may continue to use these gears to some extent during times outside of the PLL repose period, which could result in potential additional reductions in protected species interactions.

The Trustees anticipate that the proposed action would result in short-term and long-term benefits to the protected species subject to bycatch under normal PLL fishing practices. Short-term benefits are anticipated for marine mammals and sea turtles, particularly leatherbacks, because protected species would remain in the population and continue to grow to maturity and/or contribute to the propagation

of their respective species. Long-term benefits are anticipated for sea turtles and marine mammals because of the future generations of protected species and population growth that could occur as a result of increased survival of protected species that had occurred in the short-term. Short-term and long-term benefits are anticipated for seabirds due to their already low interaction rate with PLL fishing gear in the GOM.

14.2.6.2.3 Invasive Species – EO 13112

Executive Order 13112 directs federal agencies to work together to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. Restoration activities to restore and protect finfish and shellfish are unlikely to introduce invasive species due to the nature of the activity. This project would be implemented in accordance with all applicable laws and regulations concerning prevention and introduction of invasive species. In considering the nature of the proposed project (project implementation not involving construction or disturbance of habitat) no activities would have a likelihood to introduce or spread invasive species.

14.2.6.2.4 Summary of Impacts to the Biological Environment

The impacts to the biological environment from the proposed action (implementation of the project) are overall expected to result in short and long-term benefits for living marine and coastal resources as well as protected species. The reduction of PLL gear sets in the GOM would eliminate PLL bycatch of pelagic finfish as well as marine mammals, sea turtles, and seabirds from those vessels for 6 months of the year during a period that coincides with bluefin tuna spawning season. Greenstick and buoy gear are both alternative gear types that have less interactions with protected species, and are monitored much more closely and frequently by fishermen, thus resulting in fewer dead discards. Short-term benefits are anticipated because living marine resources and protected species (marine mammals and sea turtles) would remain in the population and continue to grow to maturity and/or contribute to the propagation of their respective species. Long-term benefits are anticipated because of the future generations of living marine resources and protected species (marine mammals and sea turtles) and population growth that could occur as a result of increased survival of living marine resources and protected species that had occurred in the short-term. Minor short-term and long-term benefits are anticipated for seabirds due to their already low interaction rate with PLL fishing gear in the GOM.

14.2.6.3 Human Uses and Socioeconomics

14.2.6.3.1 Socioeconomics and Environmental Justice

Affected Environment

The average ex-vessel prices per pound dressed weight (dw) for 2005 to 2012 by Atlantic HMS and area are summarized in Table 14-17. Prices are reported in nominal dollars. The ex-vessel price is the price for the catch upon arrival at port (unloading of the catch). The ex-vessel price depends on a number of factors including the quality of the fish (e.g., freshness, fat content, method of storage), the weight of

the fish, the supply of fish, and consumer demand. Data for Atlantic HMS landings weight is as reported per the U.S. National Report (NMFS 2013), the information used in the shark stock assessments, information given to ICCAT (Cortés pers. comm., 2013), as well as price and weight reported by Atlantic bluefin tuna dealers. These values indicate that the estimated total annual revenue of Atlantic HMS fisheries has increased in 2012 to $60.4 million from $50.0 million in 2011. From 2011 to 2012, the Atlantic tuna fishery's total revenue increased by $9.7 million from $26.8 million in 2011 to $36.5 million in 2012. A majority of that increase can be attributed to the increased commercial landings of yellowfin tuna. From 2011 to 2012, the annual revenues for the shark fisheries remained virtually unchanged. Finally, the annual revenues for swordfish increased by $4.4 million from 2011 to 2012 due to an increase in landings.

Table 14-17. Average Ex-vessel Prices per Pound for Atlantic HMS, by Area (2006-2013)

Species	Area	2006	2007	2008	2009	2010	2011	2012	2013
Bigeye tuna	Gulf of Mexico	$5.73	$5.66	$6.12	$5.80	$5.79	$5.64	$6.19	$3.36
	S. Atlantic	3.94	4.34	4.34	4.11	4.03	4.73	4.75	5.15
	Mid-Atlantic	4.96	5.48	5.70	5.42	5.86	6.38	6.90	6.30
	N. Atlantic	4.54	5.31	5.60	5.18	4.79	5.39	5.67	5.50
Bluefin tuna	Gulf of Mexico	4.78	5.63	4.51	4.65	5.42	6.38	7.16	6.72
	S. Atlantic	10.42	11.16	13.29	14.43	8.75	7.34	8.20	7.52
	Mid-Atlantic	7.92	6.95	7.94	10.10	8.94	10.64	10.95	9.02
	N. Atlantic	7.68	8.31	8.31	7.06	8.38	10.21	11.57	8.60
Yellowfin tuna	Gulf of Mexico	2.89	3.02	3.51	3.04	3.72	3.65	3.51	3.66
	S. Atlantic	2.32	2.69	2.99	2.90	3.53	3.93	4.63	3.64
	Mid-Atlantic	2.39	2.99	3.30	2.50	3.43	3.45	4.46	4.73
	N. Atlantic	2.63	3.17	3.82	2.86	2.80	3.39	4.22	3.98
Albacore tuna	Gulf of Mexico	0.62	0.53	0.49	0.55	1.40	1.09	0.68	0.82
	S. Atlantic	0.93	1.24	1.21	1.29	1.36	1.42	1.64	2.07
	Mid-Atlantic	0.82	0.86	0.97	1.10	1.30	1.19	1.25	1.42
	N. Atlantic	0.98	1.37	2.00	1.26	1.56	1.55	1.34	1.92
Skipjack tuna	Gulf of Mexico	-	-	-	0.50	-	0.90	0.75	-
	S. Atlantic	0.74	0.73	0.95	0.95	1.13	1.25	1.10	0.80
	Mid-Atlantic	0.79	2.22	4.50	-	-	0.60	1.06	0.87
	N. Atlantic	-	-	-	-	-	-	-	0.93
Swordfish	Gulf of Mexico	2.90	3.07	2.93	2.69	3.53	4.15	3.42	3.53
	S. Atlantic	3.86	4.24	4.11	4.12	4.63	4.84	4.97	5.00
	Mid-Atlantic	3.52	4.07	3.50	3.40	4.43	4.44	4.51	4.49
	N. Atlantic	3.65	4.11	4.20	3.49	4.61	4.22	4.49	4.63
Large coastal sharks	Gulf of Mexico	0.75	0.42	0.67	0.52	0.48	0.38	0.40	0.46
	S. Atlantic	0.47	0.54	0.72	0.55	0.65	0.61	0.75	0.77
	Mid-Atlantic	0.28	0.56	0.71	0.57	0.64	0.54	0.67	0.65
	N. Atlantic	-	-	-	-	-	-	-	-
Pelagic sharks	Gulf of Mexico	1.21	1.29	1.18	1.25	1.47	1.54	1.33	1.53
	S. Atlantic	1.23	1.29	1.29	1.25	1.27	1.46	1.74	1.66
	Mid-Atlantic	1.15	1.06	1.20	1.16	1.19	1.30	1.39	1.72
	N. Atlantic	0.73	0.85	0.96	1.23	1.28	1.48	1.68	1.97
	Gulf of Mexico	0.51	0.58	0.62	0.69	0.55	0.58	0.66	0.33

Species	Area	2006	2007	2008	2009	2010	2011	2012	2013
Small coastal sharks	S. Atlantic	0.68	0.80	0.78	0.71	0.79	0.81	0.99	0.72
	Mid-Atlantic	0.45	0.43	0.48	0.57	0.57	0.59	0.68	0.83
	N. Atlantic	-	-	-	-	-	-	-	-
Shark fins	Gulf of Mexico	16.40	13.22	14.94	15.09	16.48	15.11	14.97	11.06
	S. Atlantic Mid-Atlantic	13.24	11.44	12.73	13.15	15.35	14.91	11.00	6.02
		9.82	6.12	3.74	3.62	6.83	3.50	2.79	1.45
	N. Atlantic	6.23	3.24	3.00	3.67	2.40	1.60	1.86	1.85

NMFS has collected operating cost information from commercial permit holders via logbook reporting. Each year, 20 percent of active Atlantic HMS commercial permit holders completing logbooks (i.e., pelagic longline vessels) are selected to report economic information along with their Atlantic HMS logbook or Coastal Fisheries logbook submissions. In addition, NMFS also receives voluntary submissions of the trip expense and payment section of the logbook form from non-selected vessels.

The primary expenses associated with operating an Atlantic HMS permitted pelagic longline commercial vessel include labor, fuel, bait, ice, groceries, other gear, and light sticks (on swordfish trips). Unit costs are collected on some of the primary variable inputs associated with trips. The unit costs for fuel, bait, and light sticks from vessels selected for reporting are shown in Table 14-18. Fuel costs increased over 89 percent from 2005 to 2012 while the cost per pound for bait remained fairly constant from 2005 to 2010 but nearly doubled between 2010 and 2011 and has remained at this new level in 2012. The unit cost per light sticks has actually declined from 2005 to 2011, but increased in 2012.

Table 14-19 provides the median total cost per trip of vessels selected for reporting for the major variable inputs associated with Atlantic HMS trips taken by pelagic longline vessel. Fuel costs are one of the largest variable expenses. While fuel costs increased slightly in 2012, total fuel costs per trip decreased by 14 percent in 2012 suggesting that shorter trips were taken in 2012.

Labor costs are also an important component of operating costs for HMS pelagic longline vessels. Table 14-20 lists the number of crew on a typical pelagic longline trip of vessels selected for reporting. The median number of crew members has been consistently three from 2005 to 2012. Most crew and captains are paid based on a lay system. According to Atlantic HMS logbook reports, owners are typically paid 50 percent of revenues. Crew in 2012 received 30 percent on average. These shares are typically paid out after costs are netted from gross revenues. Median total shared costs per trip on pelagic longline vessels have ranged from $5,000 to $11,306 from 2005 to 2012.

Table 14-18. Pelagic longline vessel median unit costs for fuel, bait, and light sticks (2006 – 2012)

Input Unit Costs ($)	2006	2007	2008	2009	2010	2011	2012
Fuel (per gallon)	2.15	2.25	3.55	1.73	2.50	3.38	3.50
Bait (per lb)	0.85	0.85	0.81	0.81	0.85	1.53	1.58
Light sticks (per stick)	0.46	0.36	0.37	0.37	0.28	0.25	0.30

Source: NMFS 2014b; HMS Logbook Data.

Table 14-19. Median input costs for pelagic longline vessel trips (2006 – 2012)

Input Costs ($)	2006	2007	2008	2009	2010	2011	2012
Fuel	1,728	3,012	3,600	3,000	2,480	3,445	2,963
Bait	1,115	1,200	1,500	1,875	1,731	3,671	3,600
Light sticks	728	648	600	600	493	663	750
Ice costs	498	540	540	625	225	726	759
Grocery expenses	696	786	800	1,000	752	900	900
Other trip costs	1,200	1,500	1,651	1,670	1,500	2,000	1,443

Source: NMFS 2014b; HMS Logbook Data.

Table 14-20. Median labor inputs for pelagic longline vessels (2006 – 2012)

Labor	2006	2007	2008	2009	2010	2011	2012
Number of crew	3	3	3	4	3	3	3
Owner share (%)	50	47	45	45	50	50	50
Captain share (%)	20	20	20	20	23	20	25
Crew share (%)	13	15	15	30	29	29	30
Total shared costs ($)	5,657	5,566	6,037	7,000	6,500	11,306	9,000

Source: NMFS 2014b; HMS Logbook Data.

In 2013, NMFS created a cost model to estimate trip expenses across the entire fishery. Trip expenses included fuel, bait, light sticks, grocery expenses, and other trip costs. Average trip expenses, trip revenue, trip net-income, and profit margin are presented for the GOM region, and the average for all regions, and year in Table 14-21. Revenue equals total ex-vessel sale of all species landed on a particular trip. Net revenue per trip is trip revenue minus trip expenses.

Table 14-21. Average values for Gulf of Mexico (GOM) & All regions (including GOM) in Atlantic HMS fisheries (2006-2012)

Measure	2006	2007	2008	2009	2010	2011	2012	Average
GOM trip expense	$9,339	$9,831	$12,695	$10,533	$11,261	$12,442	$13,558	$11,209
All regions trip expense*	$7,940	$8,104	$10,329	$8,986	$9,454	$11,410	$11,538	$9,702
GOM trip revenue	$14,201	$16,283	$17,069	$17,735	$16,752	$30,878	$30,417	$19,917
All regions trip revenue*	$18,258	$20,210	$19,047	$20,270	$22,126	$28,841	$28,267	$22,507
GOM trip net-income	$4,862	$6,452	$4,375	$7,202	$5,492	$18,436	$16,859	$8,709
All regions net-income*	$10,318	$12,106	$8,705	$11,284	$12,672	$17,431	$16,729	$12,802
GOM operating profit margin per trip	-1%	4%	-31%	16%	-13%	36%	37%	7%
All regions operating profit margin*	30%	35%	8%	24%	18%	39%	34%	27%

* Includes trips that were not assigned to a region. Source: HMS Cost Earnings Database; HMS Logbook Data.

It should be noted that operating costs for the Atlantic HMS commercial fleet vary considerably from vessel to vessel. The factors that impact operating costs include unit input costs, vessel size, target species, and geographic location among other things.

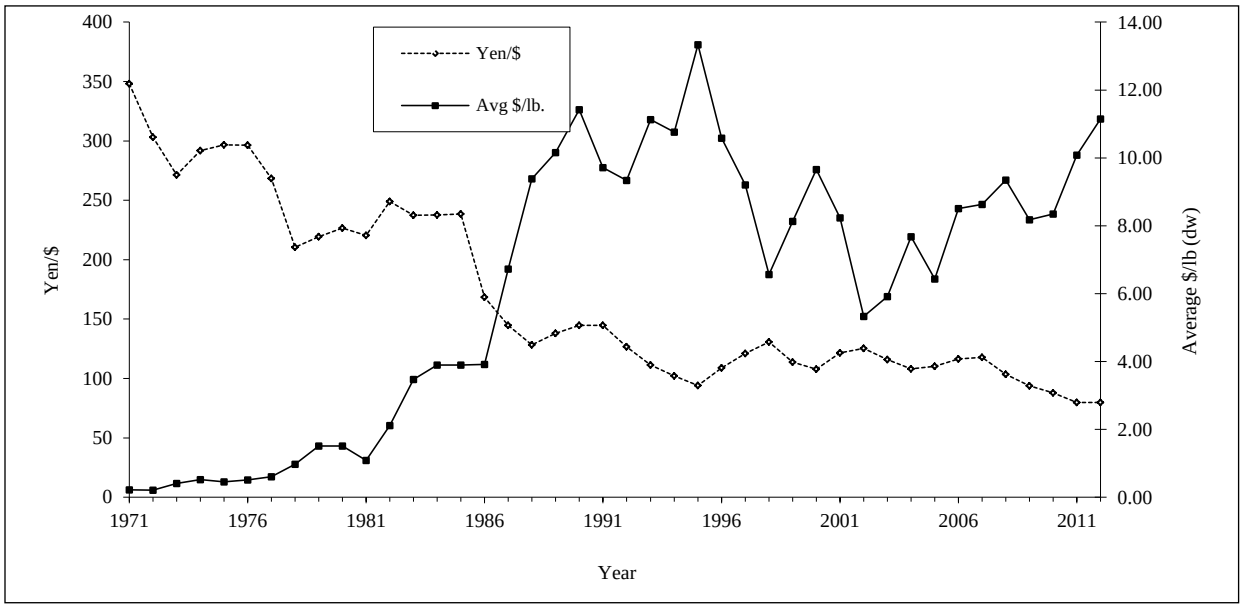
Average ex-vessel prices for bluefin tuna have risen 11 percent since 2011 (Table 14-22). The ex-vessel prices for bluefin tuna can be influenced by many factors, including market supply and the Japanese Yen/U.S. Dollar (¥/$) exchange rate. Figure 14-9 shows the average ¥/$ exchange rate, plotted with average ex-vessel bluefin tuna prices, from 1971 to 2012.

Table 14-22. Average ex-vessel prices per pound for bluefin tuna by area and year

Species	Area	2006	2007	2008	2009	2010	2011	2012
Bluefin tuna	Gulf of Mexico	$4.78	$5.63	$4.51	$4.65	$5.42	$6.38	$7.16

Source: NMFS 2014b.

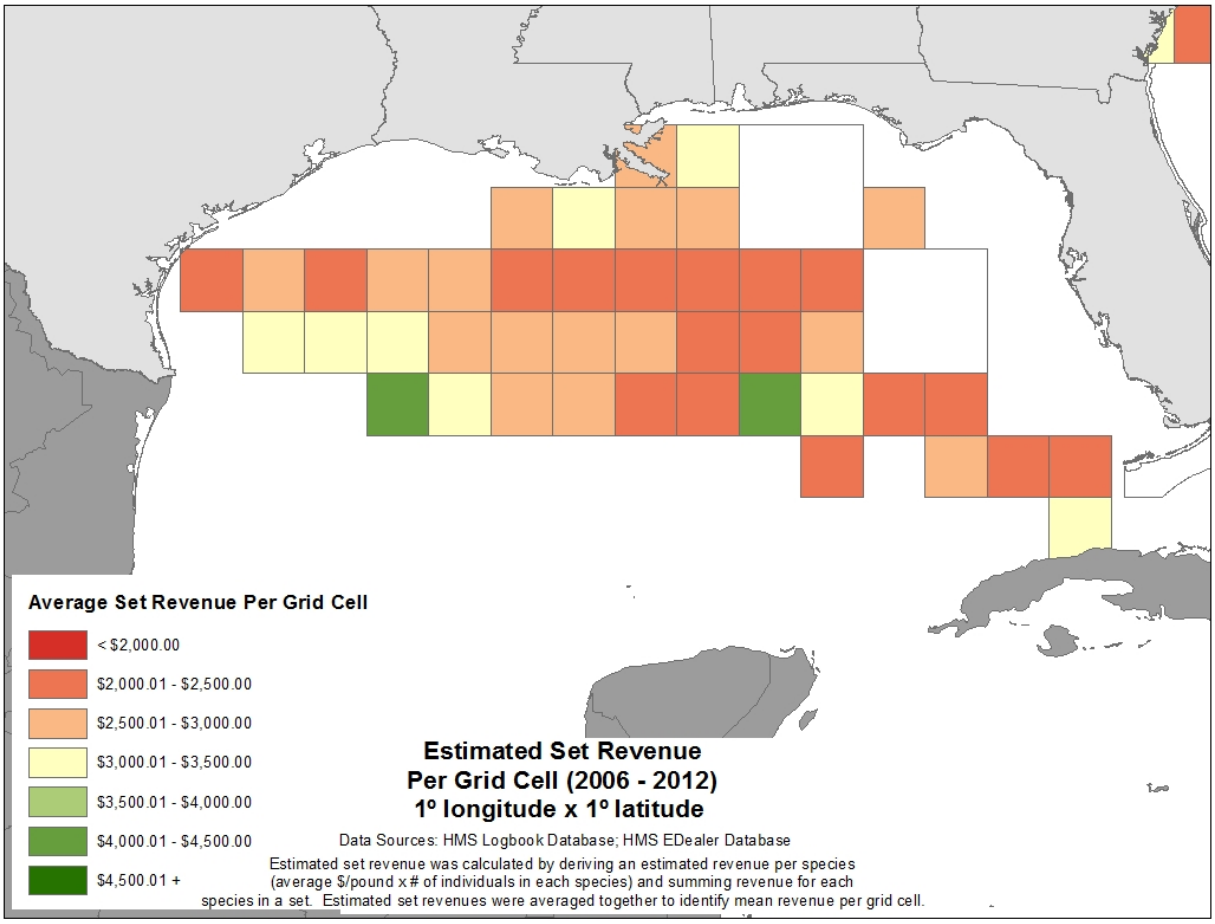
Figure 14-9. Average price per pound (dw) of Atlantic bluefin tuna landed in the U.S. (right-axis) compared to the exchange rate between the Japanese yen and the U.S. dollar (left-axis) by year for all gears



Source: NMFS 2014b; Federal Reserve Bank (research.stlouisfed.org) and NMFS Northeast Regional Office.

Distribution of average set revenue in the GOM is shown in Figure 14-10. Set revenue for all sets reported within 1º x 1º grid cells were averaged to protect confidential business information, and only grid cells with more than three vessels were included.

Figure 14-10. Average Pelagic Longline Set Revenue in the Gulf of Mexico (2006 – 2012) by One Degree Grids. Source: HMS Logbook Data



Pelagic longline vessels based in the GOM have reported very little fishing activity (less than 1 percent of sets) outside of the GOM based a review of logbook records from 2006 through 2012. This indicates that there is a low likelihood that pelagic longline vessels based in the GOM would shift their fishing effort to other areas, at least in the short-term.

Environmental Justice

Executive Order 12898 requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of programs, policies, and activities on minority or low income populations. Environmental justice review should be incorporated into the NEPA process and, where disproportionate adverse effects on minority and low-income populations are identified, address those impacts. Environmental justice was considered based on community profile information found in the 2011 and 2012 SAFE Report (NMFS 2011 and 2012). Demographic data for coastal counties was evaluated, taking into consideration communities that could be disproportionately affected by an HMS

fishery action. It found that while there are dispersed low-income, minority Vietnamese-American populations in Louisiana that actively participate in the GOM PLL fishery and commute to fishing ports, demographic data indicate that coastal counties with fishing communities are variable in terms of social indicators like income, employment, and race and ethnic composition. The proposed PLL project would not disproportionately affect minority or low-income populations. The proposed project is voluntary in nature, and as such, any fisher in the GOM PLL fishery would choose whether or not to participate in the repose and alternative gear provisioning. Those that elect to participate would receive compensation and have the opportunity to continue fishing for PLL during the repose period with the provisioned alternative gears.

Environmental Consequences

Sections 6.3.7.2 and 6.7.7.2 of the Phase III ERP PEIS describe the impacts to human use and socioeconomics from Early Restoration projects intended to restore and protect finfish and shellfish. For this project, impacts to human use and socioeconomics associated with potential actions (including the no action alternative) were adequately analyzed within the PEIS. Potential effects for the proposed PLL Project primarily stem from vessels that would fish in the GOM.

No Action

This alternative would not increase or decrease the number of active PLL fishing vessels or the number of fishing vessels using PLL gear, greenstick or buoy gear and would result in no change in human use or socioeconomic effects.

Proposed Action

PLL Repose

Under the proposed action, owners of PLL vessels participating in the proposed PLL Project would be compensated for not fishing with PLL gear. The mechanism for agreements with PLL vessel owners, compensation mechanisms, and methods for determining appropriate compensation would be identified during implementation. It is anticipated that determination of compensation amounts would consider information similar to that described in Section 14.3.6.3.1.1 and elsewhere in this document such as landings, vessel revenues, fishing permits, vessel monitoring system records, historical vessel landing receipts, logbook records showing historical fishing effort, revenues, and other historical fishing and economic documentation for the vessel.

NMFS anticipates that the amount of compensation for vessels participating in the proposed PLL Project would be commensurate with the historical revenues of the vessels during the repose period, thus NMFS anticipates no effect on vessel revenues. Although selection of PLL Project participants would be prioritized by willingness to participate in the alternative fishing gear portion of the project, vessels participating in the project might not fish at all during the repose in which case the vessels might remain at dock and incur less equipment “wear and tear” and less repair cost than might occur if the vessels fished year round.

Whether or not the captain and crews of PLL vessels participating in the proposed PLL Project receive compensation during the repose would be at the discretion of the owners of vessels participating in the repose. Vessel owners may or may not decide to provide such compensation to captain and crew members during the repose period. If vessel owners decide to provide compensation to captain and crew members, there could be no economic effect from the proposed PLL Project if the compensation is commensurate with the salaries that captain and crew members would normally receive if they were fishing with PLL gear. If vessel owners decide not to provide compensation to the captain and crew members, there could be moderate and short-term negative economic effects from the project due to the reduction in income. Also, some beneficial short-term social effects could occur for captain and crew members if they are able to spend more time with family and friends during the repose. Economic and social effects under the alternative fishing gear portion of the project as described below.

During the proposed PLL Project, fish dealers may experience a reduction in the amount of fish brought to the dock, which may have minor negative economic effects; however, these effects are anticipated to be short-term due to the limited duration of the repose period (6-months) and the fraction of the fleet expected to participate in the project. Negative economic effects may be partially mitigated by the alternative fishing gear portion of the project described below.

During the proposed PLL Project, fuel suppliers may experience a reduction in the amount of fuel sold, which may have negative economic effects; however, these effects are anticipated to be minor and short-term due to the limited duration of the repose period (6-months) and the fraction of the fleet expected to participate in the project. Negative economic effects may be mitigated by the alternative fishing gear portion of the project as described below.

During the proposed PLL Project, shoreside ice, bait, and equipment suppliers may experience a reduction in sales because PLL vessels are not fishing. This may result in adverse economic effects; however, these effects are anticipated to be minor and short-term due to the limited duration of the repose period (6-months) and the fraction of the fleet expected to participate in the project. Negative economic effects may be mitigated by the alternative fishing gear portion of the project as described below.

Alternative Fishing Gears

Under the proposed action, selection of participants in the proposed PLL Project would be prioritized based on willingness to utilize provided alternative gears to harvest target species in the GOM. The use of the provided alternative gears would facilitate participants to fish during the PLL repose in the GOM including areas that are otherwise closed to PLL fishing. Under existing regulations, greenstick fishing gear is authorized for all and buoy gear is authorized for some vessels permitted in the U.S. Atlantic PLL fishery, thus any additional fishing effort with greenstick or buoy gear would not result from any newly authorized opportunity, rather it would be facilitated by a reduction of fishing effort with PLL and economic incentive provided by the project. The Trustees anticipate a reduction in landings since the alternative gears have more limited ability to deploy the scale of effort (as measured by the number of hooks deployed) than pelagic longline gear and new users of these alternative gears in the GOM need

time to develop familiarity and skill in the efficient use of these alternative gears in this region. Because of the fraction of the fleet expected to participate in the project, the Trustees expect socioeconomic affects to be minor and short-term.

Through the use of alternative fishing gears during the repose, vessel captains and crews could continue to receive salaries; fish dealers may experience less of a disruption in fish supplies than might occur if no fishing occurred; fuel suppliers may continue to sell fuel to vessels participating in the PLL repose; and ice, bait, and equipment suppliers may not see as large of a change in sales as if no fishing occurred. There may also be some differences in fish quality harvested by these alternative gear types, which may affect ex-vessel prices based on some anecdotal feedback NMFS received from dealers. Under the alternative gear portion of the proposed PLL Project, any adverse economic effects are anticipated to be minor and short-term.

14.2.6.3.2 Cultural Resources

Affected Environment

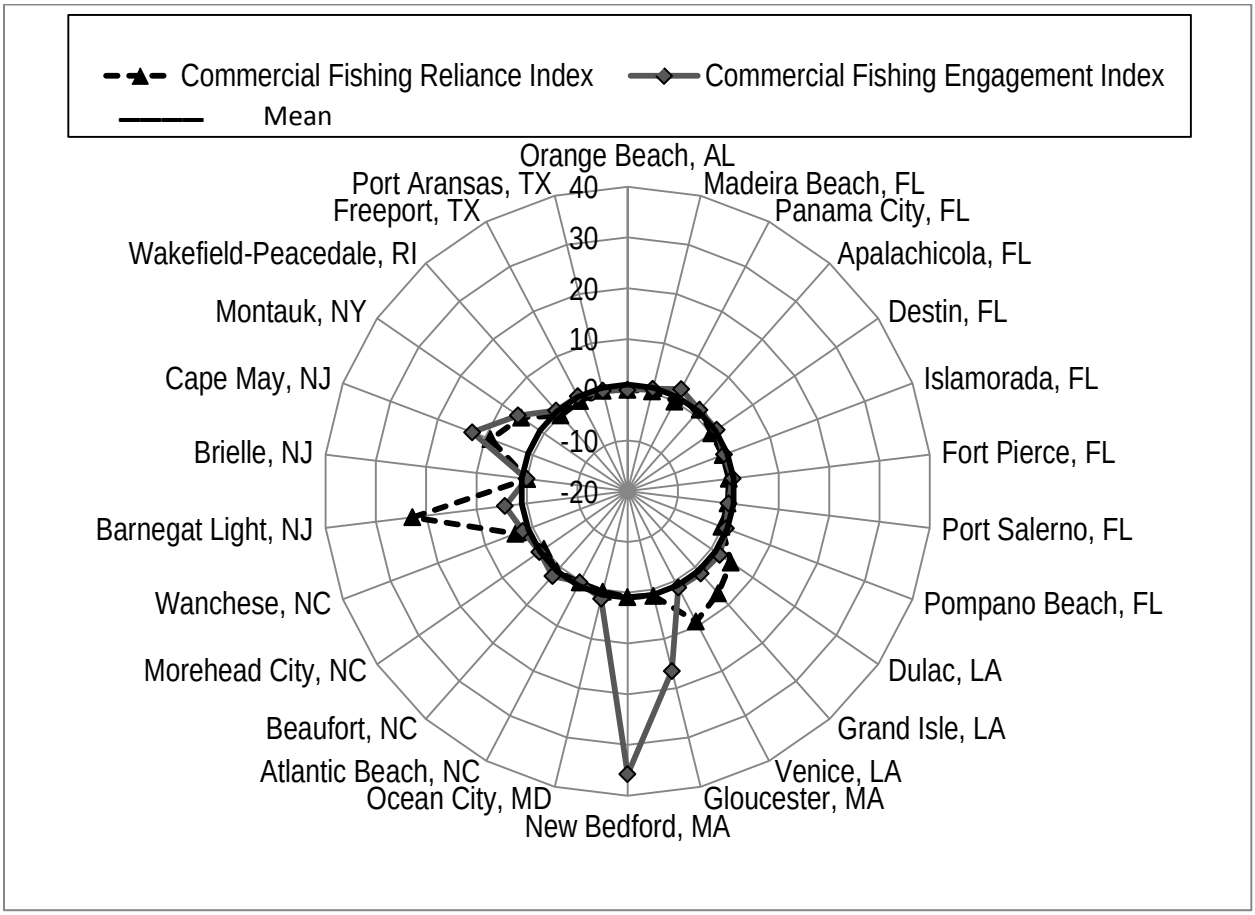
Any impacts from changes in HMS pelagic longline fishing on cultural resources likely occurs in fishing communities associated with the most active pelagic longline ports in the GOM. Figure 14-8 is a map of the GOM HMS PLL fishing ports. The top five ports of landing (as measured by the number of gear sets made from 2006 to 2012) include Dulac, LA; Panama City, FL; Golden Meadow, LA; Venice, LA; and Galveston, TX.

Jepson and Colburn (2013) developed a series of indices using social indicator variables that could assess a coastal community's vulnerability or resilience to potential economic disruptions such as those resulting from drastic changes in fisheries quotas and seasons, or natural and anthropogenic disasters. This section uses a radar graph to present indices related to fishing dependence vulnerability for commercial fishing. Indices and index scores were developed using factor analyses of data from the United States Census, permit sales, and landings reports (Jepson and Colburn, 2013). Additional analyses by Jepson and Colburn (2013) related to recreational fishing, social vulnerability, and gentrification are detailed in the 2014 SAFE Report (NMFS 2014b).

Fishing Reliance and Engagement Indices

Jepson and Colburn (2013) calculated indices measuring community reliance on and engagement with commercial fishing. Commercial fishing engagement was assessed based on pounds of landings, value of landings, number of commercial fishing permits sold, and number of dealers with landings. Commercial fishing reliance was assessed based on value of landings per capita; number of commercial permits per capita; dealers with landings per capita; and percentage of people employed in agriculture, forestry, and fishing. Communities with higher reliance index scores may be relatively more susceptible to effects from changes in fishing practices or markets. Figure 14-11 shows that Dulac, LA; Grand Isle, LA; and Venice, LA; all score above the one standard deviation threshold for both indices indicating they are all dependent upon commercial fishing.

Figure 14-11. Commercial Fishing Engagement and Reliance Indices by HMS Community



Environmental Consequences

Sections 6.3.7.2 and 6.7.8.2 of the Phase III ERP PEIS describe the impacts to cultural resources from Early Restoration projects intended to restore and protect finfish and shellfish. For this project, impacts to cultural resources associated with potential actions (including the no action alternative) were adequately analyzed within the PEIS. Potential effects for the proposed PLL project primarily stem from vessels that would fish in the GOM.

No Action

This alternative would not increase or decrease the number of active PLL fishing vessels or the number of fishing vessels using PLL gear, greenstick or buoy gear and would not have cultural resource effects.

Proposed Action

Although selection of participants in the proposed PLL Project would be prioritized based on willingness to participate in the alternative fishing gear portion of the project, vessels participating in the project

might not fish at all during the repose. If PLL vessels do not fish with alternative gears during the repose, there may be minor and short-term indirect adverse effects with respect to cultural resource values for captains and crews, fish dealers, fuel suppliers, and ice, bait, and equipment suppliers. This could result in changes in activities in fishing communities during the repose time periods.

Selection of participants in the proposed PLL Project would be prioritized based on willingness to utilize provided alternative gears to harvest target species in the GOM. The use of the provided alternative gears would help to sustain actions that support the cultural resource value of the target fisheries. An initial reduction in landings is anticipated; however, landings are expected to increase as alternative gear is tuned for the GOM and as fishers are trained on its use. Because of the fraction of the fleet expected to participate in the project, the Trustees expect cultural resource effects to be minor and short-term.

National Historic Preservation Act of 1966

The NHPA charges the federal government with protecting the cultural heritage and resources of the nation. A complete review of this project under Section 106 of the NHPA would be completed as environmental review continues. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

14.2.6.3.3 Land and Marine Management

Coastal Zone Management Act

The Coastal Zone Management Act of 1972 requires that federal actions be consistent with federally approved coastal zone management programs for states where proposed activities would affect a coastal use or resource of the state. The CZMA defines coastal zones wherein development is subject to management to protect areas and resources that are unique to coastal regions. The PLL Project would be undertaken, in part, in coastal areas and/or would benefit resources covered by federally approved Coastal Management Plans in Texas, Louisiana, Mississippi, Alabama, and Florida. Because the PLL Project has reasonably forseeable effects on the coastal uses or resources in each of the Gulf states, the Federal Trustees submitted a consistency determination for this project to the Texas General Land Office, the Louisiana Office of Coastal Management, the Mississippi Department of Marine Resources, the Alabama Department of Environmental Management, and the Florida Department of Environmental Protection via letters on May 21, 2015. Between June 22 and July 10, 2015, each of these agencies responded concurring with that determination of consistency on behalf of its state. As noted in several of the state responses, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in each state, as may be applicable.

14.2.6.3.4 Tourism and Recreational Use

Affected Environment

As previously noted, the proposed PLL Project is expected to reduce fish mortality from bycatch and regulatory discards in the GOM PLL fishery. The impact of the proposed project on tourism and

recreational use would therefore primarily be related to recreational fishing activities associated with pelagic fish species in the GOM. Reductions in fish mortality by the commercial sector could result in enhanced fishing opportunities in the recreational fishing sector. The following section characterizes the HMS recreational sector in the GOM.

Recreational Fisheries

HMS recreational fishing provides significant positive economic impacts to coastal communities which are derived from individual angler expenditures, recreational charters, tournaments, and the shoreside businesses that support those activities.

The American Sportfishing Association (ASA) has a report listing the 2006 economic impact of sportfishing on specific states. Florida and Texas are among the top ten states in terms of overall economic expenditures for both saltwater and freshwater fishing. Florida is also one of the top states in terms of economic impact of saltwater fishing with $3.0 billion in angler expenditures, $5.1 billion in overall economic impact, $1.6 billion in salaries and wages related to fishing, and 51,588 fishing related jobs (ASA 2008).

The 2011 National Marine Recreational Fishing Expenditure Survey (Lovell et al. 2013) included a separate survey of HMS Angling permit holders from Maine to North Carolina. Average trip expenditures ranged from $540/trip for tuna trips to $1,151 for billfish trips on that survey. Vessel and automotive fuel was the primary trip-related expenditure for all HMS trips, and made up over 80 percent of trip costs for billfish trips, which is not unexpected given the predominance of trolling as a fishing method for billfish species such as marlin. Expenditures on these trips are likely to be similar in the GOM region.

Fishing tournaments can sometimes generate a substantial amount of money for surrounding communities and local businesses (NMFS 2011). In 2014, there were 273 registered HMS tournaments. Approximately 53% of those tournaments were registered in states along the coast of the GOM (NMFS 2014b). Generally, HMS tournaments last from three to seven days, but lengths can range from one day to an entire fishing season. Similarly, average entry fees can range from approximately $0 to $5,000 per vessel (average approximately $500/vessel – $1,000/vessel), depending largely upon the magnitude of the prize money that is being awarded. Cash awards distributed in HMS tournaments can be quite substantial; see Chapter 5 of the 2011 HMS SAFE Report for a description of some of the high-dollar tournaments.

At the end of 2004 and 2012, NMFS collected market information regarding advertised charterboat rates (NMFS 2011; NMFS 2014b). The analysis of this data focused on observations of advertised rates on the internet for full day charters. Full day charters vary from 6 to 14 hours long with a typical trip being 10 hours. Most vessels can accommodate six passengers, but this also varies from two to 12 passengers. The average price for a full day vessel charter was $1,053 in 2004 and $1,200 in 2012. Sutton et al. (1999) surveyed charterboats throughout Alabama, Mississippi, Louisiana, and Texas in 1998 and found the average charterboat base fee to be $762 for a full day trip.

Environmental Consequences

Sections 6.3.7.2 and 6.7.11.2 of the Phase III ERP PEIS describe the impacts to tourism and recreational use from Early Restoration projects intended to restore and protect finfish and shellfish. For this project, impacts to tourism and recreational use associated with potential actions (including the no action alternative) were adequately analyzed within the PEIS. Potential effects for the proposed PLL project primarily stem from vessels that would fish in the GOM.

No Action

This alternative would not increase or decrease the number of fishing vessels using PLL gear, greenstick, or buoy gear and would have no effect on pelagic fisheries resources including those targeted by recreational sectors.

Proposed Action

Under the proposed action, the dead discards of targeted and non-targeted species by PLL fishermen (participating voluntarily) would be reduced because PLL vessels would not fish during 6-months of each year of the project.

Many of the species impacted by PLL gear and thus benefitting from this project are not a target of recreation fishing sectors. The species targeted by PLL gear are targets of recreational sectors, but since these resources would continue to be targeted by those that choose to fish with the alternative gear, the Trustees expect neither beneficial nor adverse effects on the recreational fisheries. A subset of the PLL gear bycatch species are of recreational interest and would benefit in a biological context from the project as those species would remain in the population and continue to grow to maturity and/or contribute to the propagation of future year classes, thus providing additional biomass for future use by recreational fisheries. Due to the vastness of the project area and the fraction of PLL vessels participating in the project, however, there is no expected measurable net benefit to these resources in a recreational fisheries context.

14.2.6.3.5 Summary

The socioeconomic, cultural, and tourism adverse impacts from the proposed action (implementation of the project) are expected to be minor in the short and long-term. NMFS anticipates that the amount of compensation for vessels participating in the proposed PLL Project would be commensurate with the historical revenues of the vessels during the repose period, thus NMFS anticipates no effect on vessel revenues. Under this alternative, selection of participants in the proposed PLL Project would be prioritized based on willingness to utilize provided alternative gears to harvest target species in the GOM. Through the use of alternative fishing gears during the repose, vessel captains and crews could continue to receive salaries; fish dealers may experience less of a disruption in fish supplies than might occur if no fishing occurred; fuel suppliers may continue to sell fuel to vessels participating in the PLL repose; and ice, bait, and equipment suppliers may not see as large of a change in sales as if no fishing occurred. There may also be some differences in fish quality harvested by these alternative gear types,

which may affect ex-vessel prices based on some anecdotal feedback NMFS received from dealers. Under the alternative gear portion of the proposed PLL Project, any adverse economic effects are anticipated to be minor and short-term. Although selection of participants in the proposed PLL Project would be prioritized based on willingness to participate in the alternative fishing gear portion of the project, some vessels participating in the project might not fish during the repose. If PLL some vessels do not fish with alternative gears during the repose, there may be minor and short-term indirect adverse effects with respect to cultural resource values for captains and crews, fish dealers, fuel suppliers, and shore-side ice, bait, and equipment suppliers. This could result in changes in activities in fishing communities during the repose time periods. Because of the fraction of the fleet expected to participate in the project, cultural resource effects are anticipated to be minor and short-term.

14.2.7 Cumulative Impacts

As discussed in Chapter 4, CEQ NEPA regulations require the assessment of cumulative impacts in the decision-making process for federal projects, plans, and programs. Cumulative impacts are defined as "the impact on the 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" (40 C.F.R. §1508.7).

The proposed PLL Project cumulative impacts analysis tiers from the Final Phase III ERP/PEIS analysis of Alternative 4 (Contribute to Restoring Habitats, Living Coastal and Marine Resources, and Recreational Opportunities), which evaluated the type of restoration activity proposed for the proposed PLL Project. The Final Phase III ERP/PEIS analysis of cumulative impacts relevant to the proposed PLL project is incorporated by reference into the following cumulative impacts analysis for the this project. The Final Amendment 7 to the 2006 Consolidated Atlantic HMS FMP analysis of cumulative impacts is also relevant to this Phase IV PLL Bycatch project and is also incorporated by reference (NMFS 2014a). The cumulative impacts analysis in Amendment 7 examined potential direct and indirect effects of the alternatives in Amendment 7 together with past, present, and reasonably foreseeable future actions that affect the environment. The scope of the analysis considered cumulative impacts to bluefin tuna and other HMS, protected species, EFH and socioeconomic components of the Atlantic HMS fishery. The temporal scope considered actions since the adoption of the ICCAT rebuilding plan for bluefin tuna in 1998, but focused on actions since the 2006 Consolidated Atlantic HMS FMP was implemented. The geographic scope of the analysis was the range of western bluefin tuna in the U.S. EEZ. Given the publication of Amendment 7 Final Environmental Impact Statement (FEIS; August, 2014) and the relationship between Amendment 7 and this proposed PLL Project, analysis completed in the Amendment 7 FEIS is particularly connected to and largely encompasses the appropriate cumulative impacts analysis for this proposed action.

The following analysis focuses on the potential additive effects of the proposed PLL Project to the effects of the prior actions evaluated in the Final Phase III ERP/PEIS cumulative impacts analysis, those considered in the Amendment 7 FEIS, and the effects of additional past, present, and reasonably foreseeable future actions not analyzed in the Final Phase III ERP/PEIS.

14.2.7.1 Site Specific Review and Analysis of Cumulative Impacts to Relevant Resources

This section describes past, present, and reasonably foreseeable future actions that were not discussed in the Final Phase III ERP/PEIS, but which are relevant to identifying any cumulative impacts the proposed PLL Project may have on a scale relative to this action. Context and intensity, defined in Section 14.2.5, are used to determine whether a potential significant cumulative impact from the proposed PLL Project exists.

Past, present and reasonably foreseeable other future actions relevant to this action, but not analyzed in the Final Phase III ERP/PEIS, were identified through consultation with NMFS management program staff. Actions that could be relevant to the proposed PLL Project cumulative impacts analysis are defined here as those actions with similar scope, timing, impacts and/or location. While the project area is defined as the pelagic, oceanic waters of the EEZ as well as those ports associated with landings of catch by PLL gear in the GOM, relatively few types of other activities are active in the EEZ with potential for impact on the same pelagic resources. Federal and state fisheries management actions, other Phase IV projects, and other restoration actions related to the *Deepwater Horizon* Oil Spill were considered.

14.2.7.1.1 Physical Resources

No adverse impacts on physical resources were identified that would result from fewer pelagic longline hooks being fished during the repose period or from the use of alternative gear types. Depending on the types and size of vessels that participate in the project, a reduction in contaminant loadings to surface waters, air emissions or noise typical of those vessels may or may not occur. Short-term beneficial impacts to physical resources (water or air quality, noise, habitats) are anticipated as a result of potentially fewer pelagic longline hooks being fished during the repose period.

The following types of activities were identified as having potential impacts to similar physical resources as the proposed action:

Non-Fishing Activities

Potential sources of non-fishing impacts are numerous and varied, and include the introduction of chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment. Broad categories of activities that may adversely affect HMS habitat include, but are not limited to: (1) actions that physically alter structural components or substrate, e.g., dredging, filling, excavations, water diversions, impoundments and other hydrologic modifications; (2) actions that result in changes in habitat quality, e.g., point source discharges; (3) activities that contribute to non-point source pollution and increased sedimentation; (4) introduction of potentially hazardous materials; or (5) activities that diminish or disrupt the functions of EFH. If these actions are persistent or intense enough, they can result in major changes in habitat quantity as well as quality, conversion of habitats, or in complete abandonment of habitats by some species.

Climate Change

The Council on Environmental Quality (CEQ) issued revised draft guidance on the incorporation of greenhouse gas (GHG) emissions and the impacts of climate change in NEPA analysis and documentation (79 FR 77801-77831; December 24, 2014). That consideration is addressed here. If oceanographic conditions in the Atlantic or GOM change as a result of climate change, it is conceivable that one or more bluefin tuna life stages may be impacted, due to the extremely wide geographic range that bluefin life history occurs in, and the importance of oceanographic conditions to the life cycle of marine organisms including the Gulf as a bluefin spawning area. Muhling et al. (2011) used climate model simulations to predict the potential average temperature increase in the upper waters of the GOM, and subsequent suitability for bluefin tuna spawning activity. The researchers predicted that areas of suitable temperature during the late spring, when bluefin tuna currently spawn, could be reduced by over 90% by the end of the 21st century, and that early spring could become more suitable for bluefin tuna spawning activity. It is conceivable that climate change may also affect life stages of other pelagic species including highly migratory species such as swordfish; bigeye, albacore, yellowfin, and skipjack tunas; billfishes; and some sharks given that some of these species also have extremely wide geographic ranges and oceanographic conditions are important to the life cycles of these species. The results of research and analyses on the effects of climate change in marine systems are becoming more widely available. At this point it can be stated with relative certainty that changes would occur, however the timing or magnitude of changes or environmental responses remain unknown. As NOAA continues to work on assessing climate conditions, results of these analyses would be considered in the management of the resource as necessary.

14.2.7.1.2 Biological Resources, Human Uses and Socioeconomics

As a result of bycatch reduction from the proposed implementation of an annual 6-month repose, impacts on biological resources (living coastal and marine resources including EFH, protected species, marine mammals and seabirds) are expected to be beneficial in the short- and long-term. Resources would remain in the population and continue to grow and/or contribute to the propagation of their respective species. Increased survival of coastal and marine species, including protected species in the short-term could support moderate benefits in the long-term from the continuation of future generations and population growth. Minor short-term and long-term benefits are anticipated for seabirds due to their already low interaction rate with PLL fishing gear in the GOM.

Moderate short-term adverse effects to socioeconomic resources (cultural, socioeconomic, tourism and recreational use, land and marine management) may result during the repose period due to fewer pelagic longline vessels fishing or if compensation that is provided to vessel owners is not shared with captains or crew. The adverse effects could result from reductions in shoreside supplies purchases, or reduced levels of fish brought to fish dealers. Should vessels elect to fish with alternative gears or use vessels for purposes other than fishing, these same adverse effects may not occur or may occur to a lesser degree. In addition, some negligible effects to cultural resources may result, while tourism and recreational fishing use may see beneficial effects as fish species would remain in the population and

continue to grow and/or contribute to the propagation of their respective species and are hence available for future recreational use.

The following fisheries management actions were identified as having potential impacts to similar biological resources, human uses and socioeconomics as the proposed action:

Fishing Activities: Domestic Management

A review of domestic management of Atlantic tunas, including western Atlantic bluefin tuna, is available in Chapter 3 of the Amendment 7 FEIS. Atlantic bluefin tuna fisheries are managed through a quota-based system whereby quota specifications are established annually, and the fishery is closely monitored and managed with in-season actions or temporary rules. Several HMS fishery management actions and amendments have occurred. Of those, a few have some relation to this proposed action:

- On December 2, 2011, NMFS published a final rule on Vessel Monitoring System (VMS) requirements (76 FR 75492) to facilitate enhanced communication with HMS vessels at sea, provide HMS fishery participants with an additional means of sending and receiving information at sea, ensure that HMS VMS units are consistent with the current VMS technology and type approval requirements that apply to newly installed units, and to provide NMFS enforcement with additional information describing gear onboard and target species.
- On August 21, 2013, NMFS published the final rule for Amendment 8 to the 2006 Consolidated HMS FMP (78 FR 52012). Amendment 8 implemented new and modified commercial vessel permits that allow permittees to retain and sell a limited number of swordfish caught on handgear. The purpose of Amendment 8 is to provide additional opportunities for U.S. fishermen to harvest swordfish using selective handgears that are low in bycatch, given the rebuilt status of swordfish and their resulting increased availability. These management measures are intended to allow the United States to more fully utilize its domestic swordfish quota allocation, which is based on ICCAT recommendations. NMFS anticipates Amendment 8 would primarily affect the commercial handgear fishery, although the U.S. Atlantic PLL fishery could experience minor, adverse cumulative socio-economic effects as a combined result of Amendment 7 and Amendment 8.
- On June 30, 2015, NOAA's Highly Migratory Species Program announced the availability of the Final Atlantic HMS EFH 5-Year Review and intent to initiate an amendment to the 2006 Consolidated Atlantic HMS FMP to revise Atlantic HMS EFH descriptions and designations. The purpose of the Atlantic HMS EFH 5-Year Review was to gather relevant new information and determine whether revisions to existing EFH descriptions and designations are warranted, in compliance with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations. NOAA Fisheries analyzed the information gathered through the EFH review process in this final 5-Year Review and determined that revision of EFH descriptions and designations are warranted, and an amendment to the 2006 Consolidated Atlantic HMS FMP will be undertaken. The upcoming EFH amendment will consider all ten EFH components, including individual species EFH descriptions, EFH conservation and enhancement recommendations for fishing and non-fishing effects on EFH,

and identification of HAPCs, as well as scientific feedback and public comment. The Final Atlantic HMS EFH 5-Year Review is available at http://www.nmfs.noaa.gov/sfa/hms/documents/2015_final_efh_review.pdf. Because this proposed action does not enact any measures beyond those required under or that are inconsistent with the HMS management, the proposed action would not affect any potential revisions to EFH, but would be complementary to such and continue to benefit the resources.

The proposed PLL Project is built upon compensation-based voluntary participation by PLL vessel owners and is anticipated to be implemented within the existing regulatory framework including the actions mentioned above. Cumulative effects of implementing the proposed PLL Project within existing regulatory framework are anticipated to be beneficial in the short- and long-term for PLL vessel owners.

Other Related Domestic Management Actions

Amendment 7 also considered reasonably foreseeable future actions beyond fisheries management actions that may result in incremental cumulative impacts. Of those considered, the following could also contribute incrementally with respect to the proposed PLL Project:

- On August 28, 2015, NMFS published a final rule (80 FR 52198) to modify the baseline annual U.S. quota and subquotas for Atlantic bluefin tuna. The final rule increased the baseline annual U.S. Atlantic bluefin tuna quota from the 923.7-mt level established via a 2011 quota rule (76 FR 39019, July 5, 2011) by 135 mt to 1,058.79 mt, as recommended by ICCAT for 2015 and 2016. NMFS adjusted and codified the baseline annual subquotas for the domestic fishing categories consistent with the process established in Amendment 7 to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan (Amendment 7; 79 FR 71510, December 2, 2014). Specifically for 2015, NMFS augmented the Reserve category quota with available underharvest of the 2014 adjusted U.S. BFT quota and also recalculated the Purse Seine and Reserve category quotas that were announced earlier this year (consistent with the Amendment 7 annual reallocation process) to reflect the increased U.S. bluefin tuna quota. NMFS may announce additional inseason bluefin tuna actions (such as quota transfers between categories) during 2015.
- NMFS will review the ESA designation of bluefin as a "species of concern" when more information is available about the effects of the *Deepwater Horizon* oil spill (NMFS 2011).
- NMFS is considering additional actions to implement industry-funded observer programs and IBQ 2011 trading provisions.

The actions above affect the regulatory implementation of the fishery. The proposed PLL Project is a funding project for voluntary participants that would be implemented within the existing and/or future regulatory framework. As the proposed PLL Project is intended to benefit the same resources, when combined, the effect is anticipated to result in an incremental benefit to the resources.

Fishing Activities: State Fisheries Management

Within the GOM, Atlantic tunas are under Federal jurisdiction from the outer boundary of the EEZ to the shoreline, including state waters, with the exception of the state waters of Mississippi. Federal HMS regulations apply in all other state waters of the GOM. For other Atlantic HMS, Federal jurisdiction in the GOM is within the U.S. EEZ and to U.S. flagged vessels outside the U.S. EEZ. NMFS periodically reviews state tuna regulations for federal consistency as required under ATCA. Notwithstanding the cooperative management actions involving the Gulf States Marine Fisheries Commission (GSMFC), the geographic distribution of the Atlantic HMS stocks is principally in the EEZ, outside of waters within state jurisdiction.

14.2.7.2 Potential Cumulative Impacts When Evaluated with Other Phase IV Proposed Projects

Due to the nature of this proposed project and distinct geographic location, the proposed PLL Project is not anticipated to contribute to potential adverse cumulative impacts in combination with other Phase IV projects. The proposed project, Sea Turtle Early Restoration, is closest in relationship to the proposed PLL Project in that it intersects with GOM fisheries activities. Because the two proposed actions affect distinct fisheries, however, no adverse cumulative impacts are possible. Further, as both proposed projects are intended to restore and protect marine resources, together they contribute to cumulative beneficial impacts to Trustee trust resources in the GOM environment.

14.2.7.3 Summary of Cumulative Impacts of the Proposed Action

Overall, the cumulative impact of the proposed PLL Project when considered with respect to past, present, and reasonably foreseeable future actions would result in beneficial impacts over the long-term, as restoration would contribute to resource sustainability and fisheries management objectives while minimizing socioeconomic impacts on the target fisheries.

14.2.8 Summary & Next Steps

As a result of bycatch reduction from implementation of annual 6-month reposes, impacts of the proposed action on biological resources (living coastal and marine resources, protected species, EFH) are expected to be beneficial in the short- and long-term as resources would remain in the population and continue to grow and/or contribute to the propagation of their respective species. Long-term benefits are anticipated for living coastal and marine resources because of the future generations of these species and population growth that could occur as a result of increased survival of these species that had occurred in the short-term.

Beneficial impacts to physical resources (water or air quality, noise, habitats) could result from temporary reductions in fishing effort occur during 6-month reposes. However, should vessels utilize the provisioned alternative gear types in order to continue fishing during the repose periods, no net reduction in the number of vessels on the water would result. Any change in emissions levels would be

dependent upon changes in sizes of vessels or approaches to fishing such as extended periods of trolling or idling.

Moderate short-term adverse effects to socioeconomic resources (cultural, socioeconomic, tourism and recreational use, land and marine management) may result during the repose period if fewer vessels fish or should compensation not be shared with captains or crew, from reductions in shoreside supplies purchases, or reduced levels of fish brought to fish dealers. Should vessels elect to utilize alternative gear or use vessels for other purposes, these same adverse effects may not occur or may occur to a lesser degree. Negligible effects to cultural resources may result, while tourism and recreational use may see beneficial effects as fish species would remain in the population and continue to grow and/or contribute to the propagation of their respective species and are hence available for future recreational use.

The Trustees have initiated consultation on the ESA (NOAA jurisdiction), and the Magnuson-Stevens Fishery and Conservation Act . The consultation for MSFCMA is complete. For MSFCMA compliance, NOAA concurs that the project is not anticipated to adversely impact Essential Fish Habitat identified in the Gulf of Mexico Fishery Management Council's 2005 Generic EFH Amendment or in the NMFS Consolidated Atlantic Highly Migratory Species Fishery Management Plan. The Trustees reviewed the project for compliance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*.). It was determined that the project has been the subject of a number of consultations or permitting actions under the ESA under NOAA NMFS jurisdiction. These analyses have been determined sufficient and no consultation with the U.S. Fish and Wildlife Service is needed.

The Trustees also reviewed the project for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act of 1918, and determined take would be avoided (DOI 2015). The Trustees have completed coordination and reviews under the Marine Mammal Protection Act of 1972, as amended. No threatened or endangered species will be adversely affected as a result of implementing this project. Refer to Phase IV ERP/EA Chapter 14.2.6.

This project is currently being reviewed under Section 106 of the National Historic Preservation Act to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area. A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

The PLL Project will be undertaken, in part, in coastal areas and/or would benefit resources covered by federally approved Coastal Management Plans in Texas, Louisiana, Mississippi, Alabama, and Florida. Under the Coastal Zone Management Act , because the PLL Project has reasonably forseeable effects on the coastal uses or resources in each of the Gulf states, the Federal Trustees submitted a consistency

determination for this project to the Texas General Land Office, the Louisiana Office of Coastal Management, the Mississippi Department of Marine Resources, the Alabama Department of Environmental Management, and the Florida Department of Environmental Protection via letters on May 21, 2015. Between June 22 and July 10, 2015, each of these agencies responded concurring with that determination of consistency on behalf of its state. As noted in several of the state responses, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation, including as part of required federal and state permitting processes and authorizations in each state, as may be applicable.

This project is consistent with the Final Phase III ERP/PEIS programmatic Alternative 2 (Contribute to Restoring Habitats and Living Coastal and Marine Resources) and 4 (Preferred Alternative). This project will be implemented in accordance with all applicable laws and regulations. Additionally, throughout the project design process, every practical attempt will be made to avoid and minimize potentially adverse environmental, social, and cultural impacts. Best Management Practices generated from reviews of the environmental consequences of this project will be adhered to during project implementation to minimize impacts to resources.

Overall, this project would restore and protect pelagic finfish in the GOM. Further, the Trustees believe the project will have beneficial impacts on living coastal and marine resources and protected species, and would not result in significant adverse impacts on the quality of the human environment, either individually or cumulatively.

The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. Public comments and Trustee responses are found in Chapter 15.

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15.1 Introduction

The public comment period for the Draft Phase IV ERP/EA opened on May 20, 2015, was scheduled to end on June 19, 2015. The comment period was extended for 17 days, based on requests from the public, and closed on July 6, 2015. During the public review period the Trustees hosted six public meetings in Texas, Louisiana, Mississippi, Alabama, and Florida:

- June 2, 2015: Pensacola, Florida
- June 3, 2015: Mobile, Alabama
- June 4, 2015: Long Beach, Mississippi
- June 8, 2015: Belle Chasse, Louisiana
- June 10, 2015: Galveston, Texas
- June 11, 2015: Corpus Christi, Texas

At the public meetings, the Trustees accepted written comments, as well as verbal comments that were recorded by court reporters. In addition, the Trustees hosted a web-based comment submission site, and provided a P.O. Box and email address for the public to provide comments. As a result, the Trustees received comments provided at public meetings, web-based submissions, emailed submissions, and mailed-in submissions.

During the public comment period, the Trustees received approximately 2,600 submissions from private citizens; businesses; federal, state, and local agencies; non-governmental organizations; and others. Following the comment period, the Trustees reviewed all submissions. Similar or related comments contained in the submissions were then grouped and summarized for purposes of response. All comments submitted during the period for public comment were reviewed and considered by the Trustees prior to finalizing the Phase IV ERP/EA. All comments submitted are represented in the summary comment descriptions listed in this chapter, and all public comments will be included in the Administrative Record.

15.2 The Comment Analysis Process

Comment analysis is a process used to compile similar public comments into a format that can be addressed by Trustees.

Comments were sorted into logical groups by topics and issues, consistent with the range of topics applicable to the Draft Phase IV ERP/EA. The process was designed to capture and condense all comments received rather than to restrict or exclude any ideas. The comment analysis process allows the Trustees to provide an organized and comprehensive response to public comments, consistent with OPA and NEPA regulations.

The Department of the Interior's Planning, Environment and Public Comment (PEPC) database was used to manage public comments. The database stores the full text of all submissions and allows each comment to be grouped by topic and issue.

All comments were read and analyzed, including those of a technical nature; those that contained opinions, feelings, and preferences for one element over another; and comments of a personal or philosophical nature.

15.3 Summary Comments

15.3.1 General

1. Comment: Commenter(s) expressed support for the Draft Phase IV ERP/EA and identified projects.

   Response: The Trustees acknowledge this support.

2. Comment: Commenter(s) expressed support for the inclusion of an educational component for all Phase IV projects, during all stages of the project.

   Response: The Trustees recognize the important role that public education plays in their efforts to protect and restore the environment.

3. Comment: Trustees should not use Early Restoration funds for projects that do nothing to "restore or protect natural resources," or on projects that only address recreational use losses.

   Response: In Phase III, the Trustees determined that, for the purposes of Early Restoration, a mix of projects restoring natural resources and restoring losses of recreational services, both of which are permitted under OPA, is appropriate. This mix allows Trustees to address a variety of injuries caused by the Spill and contributes more broadly to the Trustees' goal of making the environment and the public whole.

4. Comment: The Trustees have not provided sufficient information and detail to allow comment on the Draft Phase IV ERP/EA. Trustees should provide more information on project planning, implementation, injury assessment, the nexus to injury, and monitoring, both in the DERP and as project implementation progresses.

   Response: The Trustees understand the interest in having more detailed information, but believe that the information presented is sufficient for purposes of developing this Early Restoration Plan. While the details vary by project, each of the proposed projects in the Draft and Final Phase IV ERP/EA includes a discussion of injury, performance criteria, monitoring and maintenance for that project. The discussion of injury in the Draft and Final Phase IV ERP/EA is a preliminary summary of information emerging from the NRDA, which is still underway. Preliminary results are available at https://www.erma.noaa.gov/. Many projects will continue to be evaluated during the permitting process which provides opportunity for additional public input. The Trustees intend to make the results of project activities, including monitoring information and plans, available to the public (e.g. through the restoration Project Atlas: http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/early-restoration-projects-atlas/).

5. Comment: The Trustees should only fund projects with a nexus to injury from the spill.

Response: Under OPA, the principle of nexus states that restoration actions must be capable of restoring, rehabilitating, replacing, or acquiring the equivalent of natural resources or services that are injured or lost as a result of an incident. This principle is a key criterion used in screening, evaluating, and selecting restoration actions to be included in any restoration plan developed under OPA. The Trustees have applied that criterion throughout the Early Restoration planning process, including in the Draft and Final Phase IV ERP/EA. The discussion of each of the Phase IV projects in this Final Phase IV ERP/EA identifies the types of injuries each project is intended to address.

6. Comment: The Trustees should be more transparent about planning and project selection and allow the public to comment on project options.

   Response: The Trustees understand the importance and value of transparency in the NRDA restoration process. As with prior phases of Early Restoration, the Trustees have made substantial efforts to ensure the public is aware of the goals of restoration, the criteria to be applied in choosing restoration projects under OPA, the on-going opportunities for the public to submit projects for consideration, and the terms and processes outlined in the Framework Agreement. As noted in the Introduction to this Chapter, the Trustees have held numerous public meetings as well as developed and actively manage several web-based information portals used to keep the public apprised about restoration planning for the Spill.

7. Comment: The Trustees should improve consistency across project descriptions, EAs and monitoring plans.

   Response: The Trustees strive for consistency among project descriptions, EAs, and monitoring plans. However, the proposed projects are by their nature different and the level of available information at this stage of planning is variable to some degree. The Trustees are ensuring that each project complies with all regulatory requirements, including OPA and NEPA and provides the necessary level of detail for these requirements

8. Comment: These projects "should be publicly-owned or have long-term agreements with private landowners … to ensure land use change will not undermine the restoration investments."

   Response: The Trustees are mindful of the need to ensure restoration benefits are not lost due to changes in land use. Siting of restoration actions on publicly owned or managed lands and the use of conservation easements, management agreements, or other forms of agreements, including with private landowners, are all strategies that may be used, where appropriate, in implementing restoration projects to ensure restoration actions are protected and sustained to the extent needed to be successful at meeting restoration objectives.

9. Comment: Trustees should include, consult, and collaborate with outside entities in the planning, implementation, and monitoring process. These entities include, but are not limited to, the public, universities, local governments, the conservation corps, private businesses, non-profit organizations, and NGOs.

   Response: Implementing Trustees are subject to and must abide by laws, regulations and policies governing their contracting and government processes and practices. Such laws, regulations, and policies will vary, depending on the Trustee agency implementing a project. The planning process for developing the Draft and Final Phase IV ERP/EA included a broad effort to engage the general public and stakeholders, including NGOs, during several key periods. In addition, stakeholders will be involved in implementation and monitoring of several projects.

10. Comment: For Living Shoreline projects, there was concern raised over the amount of dredging and water quality.

    Response: In designing and implementing projects, the Trustees will work to keep dredging to the minimum necessary and will adhere to any BMPs specified in the environmental permitting process. For the Alabama Living Shorelines projects the Trustees do not anticipate any dredging.

11. Comment. The Trustees received multiple suggestions for new restoration projects.

    Response: The Trustees appreciate the continued public interest in restoration planning, including recommendations for new restoration projects. The Trustees will continue to evaluate these ideas as potential DWH NRDA restoration projects. Project ideas can continue to be submitted and reviewed at http:www.gulfspillrestoration.noaa.gov/restoration/.

12. Comment: The Trustees received multiple editorial comments.

    Response: Suggested changes were incorporated into the ERP/EAs where appropriate.

13. Comment: There should be a comprehensive, system-wide approach to restoration planning. This would also improve the discussion of cumulative impacts.

    Response: The purpose of Early Restoration is to accelerate meaningful restoration of injured natural resources and their services resulting from the Spill while the natural resource damage assessment is ongoing. In Phase III of Early Restoration, the Trustees developed a comprehensive programmatic EIS that evaluated alternative approaches to accelerate restoration that addresses injuries to natural resources from the Spill that included a cumulative impact analysis. All projects selected for Phase IV tier from that PEIS.

14. Comment: There should be more and improved opportunities for the public to comment. In addition public meetings need to be planned around locals' availability, better publicized, have child care, and offer free parking.

    Response: The Trustees strive to identify convenient venues and take many factors into consideration including time of day, accessibility and parking in selecting meeting times and

locations. In order to make the public aware of public meeting times and locations as early in the process as practicable, the Trustees posted information about meetings via text blasts, emails, Trustee websites, local newspapers, and in the Federal Register and State registers where appropriate. The Trustees remain committed to providing multiple opportunities for public engagement and to providing advance notice of those opportunities as early in the process as possible.

15. Comment: The Trustees should prioritize land acquisition.

    Response: The Trustees recognize that land acquisition, though sometimes expensive, can contribute to restoration for some injuries in a cost-effective manner. The Trustees continue to evaluate additional projects, including those with a land acquisition component, with the goal of fully compensating the public for all resource injuries and losses that resulted from the Spill.

16. Comment: Commenter(s) suggested criteria for future project selection: make sure investments last, maintain a commitment to ecosystem restoration, provide opportunities for public participation, leverage NRDA monies to complement and increase the value of other ecosystem restoration efforts, establish a long-term monitoring and maintenance program, share information from long-term monitoring with the public.

    Response: The Trustees recognize the importance of the suggested considerations in restoration planning. Several of these are encompassed in the OPA criteria which will continue to be used in future project selection. Project evaluation criteria used in the Early Restoration process are described in Section 1.5 of the Phase IV ERP/EA (see also Section 2.1.2.1 of the Phase III ERP/PEIS). In addition, the Trustees intend to make the results of project activities, including monitoring information, available to the public (e.g. through the restoration Project Atlas: http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/early-restoration-projects-atlas/)

17. Comment: Commenter(s) expressed concern for Gulf species, including turtles, birds, corals, marine mammals and their habitats.

    Response: The Trustees acknowledge and share the public's concern for the natural resources injured as a result of the Spill.

18. Comment: The Trustees should define recovery objectives for impacted resources.

    Response: Early Restoration is being initiated prior to completion of the full NRDA, and is not intended to fully address all injuries caused by the Spill. Additional projects will continue to be proposed either in subsequent phases of Early Restoration or in a future comprehensive Damage Assessment and Restoration Plan with the goal of fully compensating the public for all resource injuries and losses that resulted from the Spill.

19. Comment: The Gulf must be restored to the pre-BP disaster condition.

Response: Restoration activities are intended to restore or replace habitats, species, and services to their baseline condition. Baseline conditions are those that would have existed had the Spill not occurred (15 C.F.R. 990.30).

20. Comment: Commenter(s) expressed support for ecological projects.

    Response: The Trustees acknowledge this support

21. Comment: Trustees need to ensure that offsets are appropriate for all projects.

    Response: The Trustees believe that the offsets are appropriate for the projects. The Trustees developed offsets, consistent with Early Restoration objectives and NRDA regulations. As required by the Framework Agreement, offsets were negotiated with BP, taking into account the unique characteristics of the projects and the benefits of early action to restore lost resource services.

22. Comment: Trustees should ensure that plans are in place to support monitoring and adaptive management, and that adequate funding is available to implement them.

    Response: NRDA regulations designate several factors that should be used to effectively gauge a project's progress and success, including restoration objective(s) and performance criteria. Restoration objective(s) have been identified for all Phase IV projects, and the Trustees' monitoring plans for each project have been included in the Final ERP/EAs. Each such plan includes the performance criteria that will be used to evaluate project success or the need for corrective action. Additional monitoring information may be developed in the future for some projects. The Trustees intend to make the results of project activities, including monitoring information, available to the public (e.g. through the restoration Project Atlas: http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/early-restoration-projects-atlas/). Projects will use monitoring efforts to ensure project designs are correctly implemented during construction and will allow for adaptive management (corrective actions) to be taken where necessary and as budget allows. Adaptive management and corrective actions will be based on data collected and observations made during monitoring episodes.

    Trustees are mindful of their obligations with regard to monitoring and management of the Phase IV projects and are committed to ensuring that Early Restoration funds are spent as intended. Adequate levels of funding are allocated to each project to complete all necessary monitoring.

23. Comment: Commenter(s) expressed support for the Trustees' "comprehensive restoration vision."

    Response: The Trustees acknowledge this support.

24. Comment: There is a need for continued response efforts to clean up remaining oil.

    Response: Decisions regarding ongoing Spill response efforts are outside the scope of NRDA process. The public is encouraged to contact the U.S. Coast Guard field unit commanders in the Gulf who remain available to respond to sightings of oil.

25. Comment: Projects designed to improve water quality should be part of early restoration.

    Response: The Trustees recognize that water quality improvement projects can contribute to restoration for some injuries. The Phase III ERP/PEIS describes the process and criteria by which project types appropriate for Early Restoration were identified and proposed. Additional restoration project types were considered by the Trustees, and will be considered further in the ongoing NRDA, but were not evaluated in detail in the Phase III ERP/PEIS further because the Trustees did not consider them appropriate for Early Restoration at this time. Potential projects to benefit resources via improvements to water quality were considered but additional time and effort was needed to evaluate these project types.

26. Comment: Trustees are not responsive to public comments.

    Response: The NRDA regulations require consideration of all public comments received and incorporation of any changes made in response to public comments into the Final ERP/EA. The Trustees take this responsibility seriously and have reviewed and considered each comment received carefully.

27. Comment: The Phase IV DERP had many "deficiencies that severely hinder readers."

    Response: The Trustees strive to organize each public document in a manner that facilitates public review and understanding. In addition, documents which provide supplemental public information, such as fact sheets and summaries, are created to provide information in an abbreviated and simplified way. The Trustees have provided links to additional resources such as State web pages to provide additional information and to facilitate public input. The Trustees will continue to identify ways to improve their techniques for providing information to the public.

28. Comment: A full environmental impact study must be conducted to examine the possibilities of fallout to the ecosystems and the biodiversity of the island's animal inhabitants.

    Response: This Phase IV ERP/EA is tiered from the programmatic plan contained in the Phase III ERP/PEIS (40 C.F.R. § 1508.28) which is incorporated i by reference (40 C.F.R. § 1502.21). The programmatic analyses included in the Final Phase III ERP/PEIS streamline Early Restoration planning by evaluating broad issues and impacts associated with all project types included in the programmatic plan, thereby allowing the Trustees to tier project-specific analyses from the programmatic analyses. For the proposed Phase IV Early Restoration projects that tier from the PEIS, the Trustees considered the extent to which additional NEPA analyses may be necessary, including whether the analyses of relevant conditions and environmental effects described in the PEIS are still valid. The Trustees have conducted project-specific Environmental Assessments for each Phase IV project, which are included in this document (see Chapters 5-14).

29. Comment: There is concern that seafood from the Gulf is still unsafe, especially shrimp, crab, and bottom feeding fish.

    Response: The Trustees acknowledge that public concerns about seafood safety related to the Spill may still arise but these are outside the scope of the Early Restoration process. The Trustees encourage members of the public with these concerns to contact state and local offices with responsibility for monitoring seafood safety in their area for further information

30. Comment: Early restoration projects need to be implemented in a manner where they do no harm, cause no short or long term environmental or economic issues, and are sustainable.

    Response: The OPA NRDA Regulations at 15 CFR 990.54(a)(4) provide factors for the Trustees to consider when selecting from a range of restoration alternatives. One of these factors is the extent to which each alternative will avoid collateral injury as a result of implementing the alternative. The regulation contemplates that restoration projects may cause some degree of collateral injury in certain instances. Avoiding, minimizing, or mitigating any adverse ecological effects from a restoration project is essential to the achieving the Trustees' goals. Narrowing the range of acceptable projects to those with no collateral adverse effects, however, would artificially exclude many restoration alternatives with very high net benefits to natural resources. The Trustees have selected projects where the adverse effects on the ecosystem can be avoided or minimized. Prior to project implementation, the Trustees will have completed coordination and reviews under the Endangered Species Act, Magnuson-Stevens Fishery and Conservation Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Coastal Zone Management Act, National Historic Preservation Act, Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and other federal statutes, where appropriate. Any BMPs and measures to avoid and minimize impacts that are identified during the permitting process or during consultations and reviews with natural resource agencies would be implemented. As a result, collateral injury would be avoided and minimized during project implementation.

31. Comment: The Trustees need to translate more materials, particularly into Spanish and Vietnamese.

    Response: The Trustees have adopted practices aimed at engaging populations with language barriers, such as making translated materials (e.g. the Phase IV ERP/EA Executive Summary, project fact sheets, and pertinent chapters) available, and providing translators at public meetings in areas with communities that do not use English as their primary language. However, it would be cost and time prohibitive to translate all documents into each requested non-English language.

32. Comment: Better processes and structures for public participation and input must be made available to native tribes, historic communities of color, coastal fishing communities, and other frontline communities that were directly impacted by the BP oil disaster.

    Response: The Trustees value the participation of all members of the public, including those specific groups noted by commenters. The Trustees have adopted practices including

providing targeted meeting notifications in local newspapers, on the radio, at community gathering places, and directly to community leaders. The Trustees will continue to use these tools and processes to encourage participation and will also consider adapting processes and/or adopting new and innovative approaches to overcoming cultural, economic, institutional, and other barriers to effective public participation, to the extent practicable.

33. Comment: The comment period should have been at least 60 days, preferably 90 days, with a 30 day review period prior to public meetings.

    Response: In response to public request, the Trustees extended the original 30-day public comment period on the Draft Phase IV ERP/EA an additional 17 days. The Trustees believe this reasonably balances the need for additional time against the need for Early Restoration.

34. Comment: Projects with significant public opposition need to have an adequate mechanism for independent review by credible experts.

    Response: The public comment period and associated meetings afford all parties the opportunity to comment, including independent experts.

35. Comment: The Trustees need to coordinate better with other restoration efforts. The cumulative impacts assessment should include positive benefits in coordination with other DWH restoration funds.

    Response: While involved in separate processes with different responsibilities, the Trustees and leaders of related restoration efforts are coordinating with one another to ensure efforts fit together for the benefit of the Gulf environment and the people affected by the Spill. Where appropriate, the cumulative impacts assessments have been updated to reflect this.

36. Comment: There should be programmatic and long-term monitoring for restoration activities. This will facilitate tracking the recovery of injured resources.

    Response: Early Restoration is intended only to accelerate the start of meaningful restoration and is not meant to be comprehensive. Recovery objectives for an endangered or threatened species are appropriately outlined in the Recovery Plan for that species, not through the NRDA process. The monitoring for Early Restoration projects focuses on the evaluation of project success, and not on long-term, broader measures of the recovery of injured natural resources and their services in the Gulf. The Trustees anticipate developing monitoring efforts for each project that is implemented during later stages of the restoration planning process.

37. Comment: Commenter(s) expressed concern over the equitable use of funds across the Gulf States.

    Response: The Trustees chose appropriate projects through a vetting process, which includes representatives from each of the state and federal Trustees. The Trustees selected the Phase IV ERP/EA projects through application of the evaluation criteria found in the Framework Agreement and the OPA regulations (see Section 1.5 of the Phase IV ERP/EA and Section 2.1.2.1 of the Phase III ERP/PEIS). The Phase IV ERP/EA is not intended to fully address all injuries caused by the Spill, and an even distribution of the DWH Early Restoration funds

among states may not always be possible or in keeping with restoration goals for injured resources and resource uses across the Gulf. A subsequent Damage Assessment and Restoration Plan (DARP) will address the goal of fully compensating the public for all resource injuries and losses that resulted from the Spill.

38. Comment: The Trustees need to review past projects in order to inform current project selection/planning and the assignment of offsets.

    Response: The Trustees developed the Early Restoration selection process as a step-wise process comprised of: (1) project solicitation; (2) project screening; (3) negotiation with BP; and (4) evaluation and environmental review of proposed projects under OPA and NEPA, including public review and comment. In this process, the Trustees are cognizant of similar projects that have been conducted under early restoration or other programs.

39. Comment: The Trustees should ensure that restoration funds are used efficiently.

    Response: The Trustees selected the Phase IV ERP/EA projects through application of the evaluation criteria found in the Framework Agreement and the OPA regulations, which include cost-effectiveness of the project (see Section 1.5 of the Phase IV ERP/EA and Section 2.1.2.1 of the Phase III ERP/PEIS). Trustees are mindful of their duties to the public to conduct the NRDA process, including project selection and implementation, with the stewardship required of public entities. To that end, Trustees follow all applicable state and federal contracting laws and standards, including those related to contractor integrity and accountability. In addition, the Trustees report on financial and project implementation progress each quarter, and that information is made available to the public.

40. Comment: The Trustees are encouraged to work with the project partners to address historic data collection issues, thereby improving data integration and quality.

    Response: The Trustees continue to work with resource agencies and the scientific community to obtain and integrate all scientifically valid data to optimize restoration efforts.

41. Comment: There needs to be accountability for the goal of a project rather than just completion. We need to know who's accountable, and what the ramifications would be if goals are not met.

    Response: The Trustees are responsible for all selected Early Restoration projects. Consistent with project funding, procedures such as corrective actions and adaptive management will be used to help the project meet its restoration goals. The results of the monitoring will be used to determine whether performance criteria that were established in the monitoring plans (found in Appendix B) were met, and if not, whether a corrective action is feasible for that particular project.

42. Comment: The Trustees need to publish all public comments and their responses to them.

    Response: All comments submitted during the public comment period were reviewed and considered by the Trustees. All public comments submitted are represented by the summary comments and are addressed in responses included in this chapter. All individual public

comments will be posted in the Administrative Record, which is publicly available (see Chapter 1 of this document (1.12).

43. Comment: The Trustees need to make fishermen whole from the economic impacts of the Spill.

    Response: The individual economic losses of fishermen are considered private rather than public claims under OPA, and are therefore are not within the scope of early restoration and the NRDA.

44. Comment: Commenter(s) expressed concern that restoration money will be used to support existing programs that impose new restrictions on fishermen.

    Response: None of the Phase IV early restoration projects propose funding for or involve new regulations on any fishermen. One fisheries-related project, the Pelagic Longline Bycatch Reduction (PLL) Project, will provide an opportunity for PLL fishermen to contribute to the restoration of bluefin tuna and other non-target species in the PLL fishery, but their participation will be entirely voluntary. Participating fishermen will be compensated for their participation if they agree not to fish with PLL gear during PLL repose periods, and will be provided with an alternative fishing gear that will allow them to continue fishing with gear that has less dead discards of target, non-target, and protected species. During time periods outside of the PLL repose and after the restoration project ends, PLL fishermen will be able to return to fishing with PLL gear.

    Another fisheries-related project , the Sea Turtle Early Restoration project, includes components (i.e. Gulf of Mexico Shrimp Trawl Bycatch Reduction and Texas Enhanced Fisheries Bycatch Enforcement) that will work to improve compliance with existing federal Turtle Excluder Device (TED) regulations. TEDs are an effective tool to reduce the bycatch of sea turtles in the Gulf of Mexico shrimp fishery. These components are focused on improving NOAA's capacity to provide education, outreach and assistance to the shrimp fishing community, and on increasing TPWD's TED enforcement effort in Texas waters. The goal is to provide guidance and resources to help fisherman comply with existing TED regulations in the Gulf of Mexico. Additionally, in Texas, the project will ensure that enforcement patrol efforts are undertaken early in the year, when sea turtle strandings are the highest, to encourage compliance with existing regulations. Reducing the bycatch of sea turtles in the shrimp trawl fishery is an effective restoration strategy for sea turtles.

45. Comment: Project performance criteria should include the same factors used to develop the offsets. This would allow the Trustees to measure success related to the offsets and assure the public that the project produced the resource benefit for which BP is credited. Additionally, including these factors would allow for future restoration projects to better estimate the resource benefit expected from restoration investments.

    Response: Early Restoration is being initiated prior to completion of the full NRDA, and is not intended to fully address all injuries caused by the Spill. While some project performance criteria may relate to factors used to develop offsets, other considerations also influence the

selection of performance criteria, including but not limited to, the availability of historical data and other ongoing monitoring efforts, utility for adaptive management purposes, and other factors. The Trustees chose performance criteria that they believe are best suited to meet these varied needs.

46. Comment: The "No Action/ Proposed Action" dichotomy fulfills the letter but not the spirit of a true assessment. We are given no alternative procedures, sites, or monitoring protocols. This approach does not give confidence that true alternatives were considered.

    Response: During the five years since the Spill occurred, each of the five Gulf States, DOI, and NOAA has used various means to solicit restoration ideas and proposed projects from the public. Hundreds of restoration proposals have been submitted, summarized, and made available both to the Trustees and to the public as a whole through various Trustee websites (see Section 2.1). These project proposals have informed and helped shape the Trustees' approach to early restoration projects. The Early Restoration project selection process, which is consistent with the Framework Agreement, constrains the range of project-level alternatives that can be considered in early restoration plans. Under the Framework Agreement, the Trustees negotiate with BP concerning the amount of funding that BP will provide for a specific proposed project and the NRD Offsets that BP will receive, to reduce its liability for NRD, in return for funding that project. Given the complexity of such negotiations, it would be impractical to negotiate funding and Offsets for multiple alternatives to each proposed project.

    Therefore, the projects proposed in each early restoration plan present choices available to the Trustees in that phase of planning. Where other alternatives were considered in identifying proposed actions in the Phase IV ERP/EAs, those have been noted in relevant project chapters. - Further, each project alternative is proposed and is selected independent of the others, so that the final plan may vary in terms of selected outcomes. In this context, the project-level alternatives presented in the Phase IV ERP/EAs are reasonable.

47. Comment: The Trustees' definition of dispersants is unscientific and colloquial.

    Response: The description of dispersants noted in the Draft Phase IV ERP/EA- that they are used to help break large globs of oil into smaller droplets that can more readily be dissolved or dispersed in the water column- is meant to facilitate public understanding of how they operate. The Trustees will use the definition of "dispersants" as described in the National Oil and Hazardous Substances Pollution Contingency Plan (40 C.F.R. 300 Subpart A) in the Final ERP/EA. This definition reads, "Dispersants means those chemical agents that emulsify, disperse, or solubilize oil into the water column or promote the surface spreading of oil slicks to facilitate dispersal of the oil into the water column."

48. Comment: The available evidence does not support the Trustees' assertion that there was "extensive oiling…from Texas to the Florida Panhandle." According to the Unified Command's Shoreline Cleanup and Assessment Technique ("SCAT") survey team, MC252 oil had been observed by SCAT teams as far west as Vermillion Parish in Louisiana and as far east as the

Florida panhandle, geographically per SCAT, but only a portion of this range was “extensively" oiled.”

Response: While the assessment of the amount of oiling that occurred across the Gulf Coast is ongoing, the Trustees believe that oiling was extensive. The discussion of injury in the Draft and Final Phase IV ERP/EA is a preliminary summary of information emerging from the NRDA. Preliminary results are available at https://www.erma.noaa.gov/.

49. Comment: Where are the data generated from monitoring plans going to be posted so that the public can review them? The Trustees should update the Phase IV Early Restoration Plan with the locations where the raw monitoring data, including records of observations, will be posted for public review, as well as explain how this count data will be used by the resource managers. It is important to provide details where this data will be posted for public review.

Response: The Trustees intend to make and have made the results of project activities, including monitoring data and reports, available to the public (e.g. through the restoration Project Atlas: http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/early-restoration-projects-atlas/). Monitoring plans for most projects will be refined as project siting and design are finalized. In addition, specifics regarding sampling methods, timing, frequency, and locations may be modified. Any updates to a monitoring plan will be available on the Project Atlas. The Trustees anticipate refining monitoring plans for each project as the project siting and design is finalized.

50. Comment: Trustees did not provide adequate supporting data for information presented in the injury assessment for ecological or human use injuries.

Response: The Phase IV ERP/EA is not intended to fully address all injuries caused by the Spill, which will be addressed in a comprehensive DARP. The preliminary assessment information presented in the Draft and Final Phase IV ERP/EA is sufficient to support selection of the Phase IV early restoration projects as proposed. Validated data from the NRDA continues to be released to the public as it becomes available.

51. Comment: Trustees did not provide a comprehensive review of the baseline condition of the Gulf of Mexico ecosystem.

Response: Baseline conditions are those that would have been present in the absence of the Spill. The assessment of injury to Gulf of Mexico natural resources includes evaluations of the baseline condition appropriate for the habitat, species, and injuries considered. Approaches for evaluating baseline condition may include comparison to historical data, field and laboratory studies that provide comparisons to conditions at reference locations, to control data or data bearing on incremental change, alone or in combination, and may include evaluations of potential confounding factors such as other sources of PAHs or other contaminants, as appropriate. (See 15 C.F.R. 990.30 Natural Resource Damage Assessments-Definitions). Presentation of a “comprehensive review” of the Trustees’ ongoing evaluation of baseline conditions in the ongoing assessment was not required to support the proposed Phase IV early restoration projects. The preliminary assessment information presented in the

Draft and Final Phase IV ERP/EA is sufficient to support selection of the Phase IV Early Restoration projects as proposed.

52. Comment: The release of freshwater by the State of Louisiana does not constitute an appropriate Response activity under OPA.

    Response: OPA makes responsible parties liable for damages that *result from* an incident in which oil is discharged, including damages for natural resource injuries. 33 USC §2702. This includes injuries resulting from response actions taken as a result of the incident, as is reinforced by OPA regulations. 15 CFR 990.30, 990.51. Freshwater diversions during the Spill clearly were performed in an effort to minimize or mitigate environmental harm from the Spill. Therefore, the public is entitled to recovery and restoration of injuries that occurred as a result of these response actions.

53. Comment: No data are presented to show that oil and dispersant vapors were present in the atmosphere.

    Response: PAHs and volatile organic compounds were detected in air near the wellhead. For example, documentation of these findings can be found in Middlebrook et al., 2012, and at https://www.aiha.org/localsections/html/NTS/OSHA%20Update%20Exposure%20Assessment%20Onshore%20and%20Offshore%20in%20the%20Deepwater%20Horizon%20Oil%20Spill%20Response_Final.pdf

54. Comment: Trustees should explain the evidence that exists to support the statement that "[d]eep sea habitats are important reservoirs of biodiversity".

    Response: Deep sea habitats are important reservoirs of biodiversity and multiple efforts over the years have recorded and documented the abundance of life found at ocean depth (Grassle and Maciolek 1992), (Rex and Etter 2010), (Ruppert and Barnes 1994), (Gage 1996).

15.4 Texas

15.4.1 Texas Rookery Islands

55. Comment: The Texas Rookery project "should be conducted in areas that have long-term protection agreements with landowners or through public ownership." Sufficient funds should be allocated for long-term monitoring and management of the bird rookery projects.

    Response: The Trustees are mindful of the need to ensure restoration benefits are not lost due to changes in land use. This project will be conducted in public lands and waters and on lands (emergent and submergent) owned by the Chambers-Liberty Navigation District, the Texas General Land Office (TGLO), and the U.S. Fish and Wildlife Service (USFWS).

    A majority of the identified rookery island enhancement project locations already have long-term leases or established management efforts in place. The Galveston Bay Foundation leases a previously restored island in Dickinson Bay from the TGLO and anticipates entering into a similar lease agreement for the Dickinson Bay Bird Island II, identified in the restoration plan. Audubon Texas manages Rollover Bay Island through a lease for the island and

submerged lands with the TGLO and Smith Point Island through a lease for the island and submerged lands with the Chambers-Liberty Navigation District. Any additional lease(s) for managing the submerged bay bottom and the construction activities would be obtained prior to implementing the proposed restoration. Maintenance activities on Dickinson Bay Island II would likely be managed by the Galveston Bay Foundation or another stakeholder, and maintenance at Smith Point and Rollover Bay Islands would likely be managed by Audubon Texas or another stakeholder. Dressing Point Island is part of the Big Boggy National Wildlife Refuge. As part of the Big Boggy National Wildlife Refuge, maintenance activities on Dressing Point Island would continue to be managed by the USFWS.

Trustees are mindful of their obligations with regard to monitoring and management of the Texas Rookery Islands project. The Trustees are committed to ensuring that Early Restoration funds are spent as intended, including 5 years of monitoring. The Texas Colonial Waterbird Society currently monitors all coastal nesting islands. The Trustees are partnering with conservation organizations and agencies that have the responsibility for managing these sites over the long-term.

56. Comment: Commenter(s) expressed support for the Texas Rookery project.

    Response: The Trustees acknowledge this support.

57. Comment: Is there a plan for fisheries monitoring around the Texas rookery islands project to determine foraging availability for the birds utilizing the rookery?

    Response: Monitoring for Early Restoration projects is focused on the evaluation of project success. Therefore Trustees monitor, following the NRDA regulations, to determine the success of the project at meeting the project restoration objective(s). The Texas Rookery Islands project will be monitored based on the Monitoring Plan found in Appendix B

    Analysis of available data of the rookery islands and nesting birds over time indicate that the numbers and types of nesting birds have declined or changed as the islands have either become smaller in size or disappeared completely. This has been observed for many Texas coastal nesting islands. Evaluation of trends over time indicates that colonial waterbirds have decreased in nesting numbers from a peak in the mid-1990s to roughly half of that today. While the exact cause for this is not apparent and there may be multiple factors influencing their numbers, a similar decline in forage or predatory fish species has not been observed. There is documentation of the loss of nesting habitat and a decrease in number of nesting birds within these bays as well as in other bays along the coast.

    The Trustees will not be conducting any additional project-specific monitoring to assess foraging availability. However, the Texas Parks and Wildlife Department (TPWD) routinely conducts bag seine and gill net monitoring in Galveston and East Matagorda Bays to assess fish populations. Currently, TPWD has observed record and near-record numbers of reds and trout in our bay systems.

58. Comment: The assessment of the Texas Rookery Islands project does not provide sufficient description and details of how the activities within each of the islands will be implemented to

allow the public to provide constructive comments. The Trustees must include an analysis of each proposed action under consideration and a determination of the preferred action.

Response: This Phase IV ERP/EA is tiered from the programmatic portions of the Phase III ERP/PEIS (40 C.F.R. § 1508.28) which is incorporated here by reference (40 C.F.R. § 1502.21). The programmatic analyses included in the Final Phase III ERP/PEIS streamline Early Restoration planning by evaluating broad issues and impacts associated with all project types included in the programmatic plan, thereby allowing the Trustees to tier project-specific analyses from the programmatic analyses. Tiering project-specific analyses reduces or eliminates duplicative documentation by focusing project analyses on project-specific issues and incorporating by reference the issues evaluated in the broad programmatic analyses. For proposed Phase IV Early Restoration projects, the Trustees have considered the extent to which additional NEPA analyses may be necessary for the projects that tier from the PEIS, including whether the analyses of relevant conditions and environmental effects described in the PEIS are still valid or whether projects have been considered in separate analyses under NEPA for purposes of other federal processes.

The Trustees understand the interest in having more detailed information, but believe that the information provided is sufficient for purposes of developing this ERP/EA and to allow for meaningful comment on the proposed project. Each of the rookery islands in the proposed project are in various phases of design. The Trustees will ensure Early Restoration projects comply with applicable federal and state laws and regulations, including any required consultations, authorizations, and public comment opportunities. Early Restoration projects that are currently undergoing review under applicable laws will incorporate BMPs as required or otherwise agreed to by the Trustees. While all consultations must ultimately be completed before project implementation, some engineering and design activities will not be completed before the final early restoration plan. Additional details will be developed as part of the permitting, design, and engineering phase. The evaluation of techniques will occur during the additional engineering and design activities, which will take into consideration the environmental impacts from the various techniques. The Trustees recognize the importance of continuing to work with stakeholders during development of the implementation details for the project.

59. Comment: The Offsets include gulls, but does not provide specific species. However, the list of species provided in the project summary only identifies laughing gulls.

Response: While additional gull species may be found in the Gulf of Mexico, only laughing gulls (*Leucophaeus atricilla*) are anticipated to nest on the Texas rookery islands targeted for restoration by this project.

15.5 Mississippi

15.5.1 Restoring Living Shorelines and Reefs in Mississippi Estuaries

60. Comment: Commenter(s) expressed support for the cumulative impacts analysis of the Restoring Living Shorelines and Reefs in Mississippi Estuaries project.

    Response: The Trustees acknowledge this support.

61. Comment: The Mississippi Grand Bay National Estuarine Research Reserve (NERR) restoration stipulations/requirements should be used throughout Mississippi.

    Response: The Trustee coordinated closely with the Grand Bay NERR staff and intends to implement projects in a manner consistent with the Grand Bay National Estuarine Research Reserve Management Plan 2013-2018. Mitigation measures and environmental review procedures for projects at the Grand Bay NERR and for those project components that are located on other Coastal Preserves are discussed in Section *6.2.7.3.2 Land and Marine Management* of the DERP.

62. Comment: Commenter(s) expressed support for the Mississippi Living Shorelines project.

    Response: The Trustees acknowledge support of the Restoring Living Shorelines and Reefs in Mississippi Estuaries project.

63. Comment: The Mississippi Living Shorelines project will fail due to poor water quality in the project area. Water quality needs to be addressed first.

    Response: The Trustees considered environmental conditions, including water quality, in the development and siting of the project. The Trustees anticipate successful reef development on breakwaters, intertidal and subtidal cultch deployments for all of the project components.

64. Comment: The monitoring criteria for Restoring Living Shorelines and Reefs in Mississippi Estuaries project are inadequate and do not address surrounding water, shorelines, benthos, and wetlands; there is no provision for adaptive management.

    Response: Monitoring will be used to evaluate the restoration goals of the project, which are: 1) construct breakwater structures to protect shoreline from erosion, to facilitate reef development, and to support secondary production; 2) restore subtidal reef habitat and intertidal reef habitat to support secondary production. Post-construction performance monitoring is proposed for five years following completion of the project to evaluate the project's performance over time with respect to the production and support of organisms on the living shoreline (e.g., secondary productivity). Components of this monitoring may include collecting information with respect to:

    - Structural integrity of breakwater structure;
    - Shoreline profile and position;
    - Spatial footprint of breakwaters, intertidal reefs and subtidal reefs; and

- Biological monitoring.

The monitoring plan is based on the current conceptual design for the project and will be refined as the project siting and design is finalized. This project will use monitoring efforts to ensure project designs are correctly implemented during construction and will allow for adaptive management (corrective actions) to be taken where necessary and as budget allows. Adaptive management and corrective actions would be based on data collected and observations made during monitoring episodes.

65. Comment: The Mississippi list of preparers is insufficient and does not contain enough technical personnel to have adequately evaluated the project.

Response: Regional Gulf Coast experts on oyster biology, estuarine ecology, fisheries and other relevant disciplines, assisted in project development using standardized techniques for shoreline protection, intertidal reef restoration and subtidal reef restoration. In addition, experts from other state and federal resource agencies reviewed and assisted in the development of all early restoration projects.

66. Comment: The Restoring Living Shorelines and Reefs in Mississippi Estuaries project needs to do a step by step coordination with the MDMR Coastal Preserves office. Intertidal and subtidal reefs should be implemented only if they will not affect marsh. Current flow studies should be done to determine what the addition of reef material will do to these bayous and the tidal marsh that they are designed to protect.

Response: During the engineering phase, final siting and design will consider tidal patterns, flow patterns and general hydrodynamics and the project effect on adjacent marshes and waterways. The Trustee has coordinated with the MDMR Coastal Preserves Program to ensure consistency with current management plans and will continue to do so. The Trustees will continue coordination as part of the environmental permitting process to avoid and minimize impacts to adjacent marsh, tidal bayous, SAVs and other natural resources on the Coastal Preserves.

67. Comment: The Restoring Living Shorelines and Reefs in Mississippi Estuaries project confuses Breakwaters and "living shorelines." The project uses these terms interchangeably, but the breakwaters described are hardened structures, not in line with current "living shoreline" development recommendations.

Response: For the purposes of the Phase IV Draft ERP/EA, Mississippi adhered to the following definitions.

Living Shoreline Approach: A shoreline management practice that provides erosion control benefits; protects, restores, or enhances natural shoreline habitat; and re-establishes land and water ecological connections and maintains coastal processes through the strategic placement of plants, stone, sand fill, and other structural organic materials (e.g. biologs, oyster reefs, etc.) or the natural establishment of organic materials such as sediments and plants. The

Mississippi Phase IV Early Restoration living shoreline project includes establishing one or more of the following components:

> **Breakwaters:** Linear structures that may utilize artificial and/or shell-based materials placed parallel to the shore in medium to high energy open-water environments for the purpose of dissipating wave energy to reduce shoreline erosion.
>
> **Reef Habitat:** Large colonial aggregations of living oysters and other bi-valves that can have subtidal as well as intertidal portions, and provide habitat for a community of other species (e.g., tunicates, fish, crabs, worms, mussels, bryozoans, and barnacles).

Living Shorelines Techniques: The Mississippi Phase IV Early Restoration project may use the following techniques to implement a living shorelines approach.

68. Comment: The goals of the project are misleadingly presented as “Restore Oysters, Protect Shorelines and Reduce Erosion” in Table 4-1. In addition, the document states that "reefs would be built using suitable cultch material" (an oyster-specific term). The goal of the Mississippi Living Shoreline project is unclear and inconsistent across the project description and monitoring plan.

    Response: “Restore Oysters” is the relevant project type from the Trustees’ preferred programmatic alternative (see Chapter 5 of the Final Phase III ERP/PEIS). In the Phase III ERP/PEIS; Section 5.3.3.6, “Restore Oysters” is described as a restoration technique which includes harvestable and non-harvestable oyster reefs for the purpose of enhance or increase secondary productivity.

    “Commercial oysters are harvested from sub-tidal areas, but intertidal oysters are believed to be important as a source of larvae to maintain populations of both intertidal and sub-tidal oysters. Not all oyster reef creation projects are for the purpose of harvest. Oyster restoration may include placement of oyster cultch material near or on exposed shorelines to establish or reestablish intertidal oyster reef and enhance or increase secondary productivity. “

    In addition, subtidal reef habitat restoration is anticipated by the NRDA Phase III Programmatic ERP/PEIS “Restore Oysters” technique. The Restoring Living Shorelines and Reefs in Mississippi Estuaries restoration goals are specific to non-harvestable intertidal and subtidal reef restoration for the purposes of increasing secondary productivity. The project goals are: 1) construct breakwater structures to protect shoreline from erosion, to facilitate reef development, and to support secondary production; 2) restore subtidal reef habitat and intertidal reef habitat to support secondary production. Post-construction performance monitoring is proposed for five years following completion of the project and will evaluate the project’s performance over time with respect to the production and support of organisms on the breakwaters, subtidal and intertidal reefs (e.g., secondary productivity).

69. Comment: The Mississippi public meeting was inadequate. There should have been several people staffing each poster to answer questions. The oral presentation for Shorelines and Reefs gave no information on what is to be done; only which sites had been chosen.

Response: Staff was available during the public meeting to answer any questions about early restoration project. Details for each project component were provided in the oral presentation.

70. Comment: The Trustees could improve the Restoring Living Shorelines and Reefs in Mississippi Estuaries project in a number of ways including a) clarifying objectives with respect to oyster production, including suitable measures of oyster restoration success in the monitoring plan, b) reconsidering the impact of hardened structures/breakwaters on existing shorelines, c) re-siting of Graveline reefs in deeper sections of the Bay and Bayou; using shell-only cultch in Graveline waters; d) closer coordination with Coastal Preserves to assess impacts and to give precedence to that program's management goals to preserve marsh.

Responses:

a) **Clarify Objectives/Monitoring**: Intertidal reef habitat, subtidal reef habitat and breakwaters will develop into living reefs and are not for the purpose of harvestable oyster production. Restoration goals/objectives are: 1) construct breakwater structures to protect shoreline from erosion, to facilitate reef development, and to support secondary production; 2) restore subtidal reef habitat and intertidal reef habitat to support secondary production. A monitoring plan, tied to these objectives is included in Appendix B of the Phase IV DERP/EA.

b) **Use of Hardened Structures/Breakwaters**: During the engineering phase, natural and manufactured materials will be considered for the establishment of breakwaters. In addition, hydrodynamics will be considered in the final design and siting of the breakwaters to avoid and minimize impacts to adjacent shorelines/wetlands, maximize protection, and facilitate reef development on the breakwaters. Regardless of the material selected, breakwaters, as well as intertidal and subtidal reef habitat are expected to provide habitat that supports benthic secondary production, including, but not limited to, bivalve mollusks, annelid worms, shrimp, crabs, and small forage fishes.

c) **Graveline Reef**: Graveline reef placement in the DERP is based on historic presences of subtidal and intertidal oysters in the Graveline Bayou area. Siting of intertidal and subtidal reefs is subject to refinement and will be based on factors including SAV and shellfish surveys. Cultch materials could include oyster shells or limestone. The Trustee will coordinate with the Coastal Preserves Program in the development and design of the project.

d) **Coordination with Coastal Preserves**: The Trustee will coordinate with the Coastal Preserves Program to ensure that the project is consistent with the all current Coastal Preserves management plan(s).

71. Comment: Where is the data generated from this monitoring plan, the “Data QA/QC, Clearance, and Release Steps” document and the “CompQAP” going to be posted so that the public can review the information?

Response: As with the other Phases of early restoration, data will be available through the www.restoration.noaa.gov Project Atlas. Data must first go through a Trustee internal QA/QC process before release to the public to ensure quality control. The "Data QA/QC, Clearance, and Release Steps" and the "CompQAP" are still in development and when final, will facilitate the process for making monitoring data available to the public.

72. Comment: The monitoring Plan should be updated with the locations where the raw monitoring data and the QA and QAP documents, including data products for each monitoring parameter, will be posted for public review. In addition, the data listed for each parameter should be included in the Annual Report and made available to the public.

    Response: As with the previous Early Restoration Projects, data and appropriate reports are being made available after the Trustee QA/QC process. The Trustees are providing annual monitoring reports which are made available to the public through the NOAA Project Atlas.

73. Comment: Why is biological monitoring and water quality monitoring only in years 3 and 5?

    Response: Timing of biological monitoring is based on when the reefs are expected to be mature to establish full secondary productivity values. The project monitoring will cover four major estuaries and hundreds of acres of reef allowing only 2 years of rigorous monitoring of productivity. For these reasons, biological and water quality monitoring was restricted to Year 3 and 5 and will be adequate to meet the monitoring requirements.

74. Comment: On Table B-3, Pages 30 and 33 of the monitoring plan:

    a) What is the basis for the performance criterion of 84 gww/m^2 of nonbivalve invertebrate infauna and epifauna?

       Response:

       Beck, S. and M.K. La Peyre. 2014. Effects of oyster harvest activities on Louisiana reef habitat and resident nekton communities. Fishery Bulletin 113(3): 327-340.

       Raw biomass data was received from contact author and utilized to set this performance criterion.

    b) Why are bivalves excluded from this criterion?

    Response: The Trustee intends to monitor bivalves; the monitoring plan will be revised to reflect this.

15.6 Alabama

15.6.1 Osprey Restoration in Coastal Alabama

75. Comment: The Trustees should visit the platforms during the breeding season; this should be clarified in the final version of the Plan.

    Response: The Trustees will monitor nesting platforms multiple times during the year, including during the active nesting season.

76. Comment: Commenter(s) expressed concern that natural trees would work better than nesting platforms described in the Alabama Osprey project since they are abundant, and provide protection from storms and predators. In addition there are already sufficient nesting platforms for public viewing of osprey, and they appear to be costly to construct.

Response: The purpose of nesting platforms in the proposed Osprey restoration project is to benefit the species, not necessarily to provide public viewing opportunities. The proposed project has been evaluated for cost effectiveness.

As natural nesting sites, i.e., tree snags, are removed along developed coastlines, nesting platforms such as the structures proposed in this project provide important nesting habitat conservation measures. When platforms are placed within view of suitable fishing habitat for the Osprey and predator guards are placed on the poles limit raccoon predation, the species benefits.

15.6.2 Living Shoreline Projects – General Comments

77. Comment: Additional information on the location, building materials, project selection for the Alabama Living Shoreline projects should be provided.

Response: The Trustees understand the interest in having more detailed information, but believe that the information presented is sufficient for purposes of developing this Early Restoration Plan. Additional details will be developed as part of the permitting, design, and engineering phase.

78. Comment: "The Restoring Living Shorelines and Reefs in Mississippi Estuaries Project monitoring plan includes monitoring not only for shoreline erosion reduction and breakwater habitat utilization, but also for the sustainability of the reef habitat and its expected productivity. The living shoreline proposals in Alabama should mirror the plan for the Mississippi project to provide consistency and ensure the long-term objectives of these projects are met."

Response: While similar in many aspects, the geographic and physical settings, and conceptual designs of the proposed Mississippi and Alabama living shorelines projects are unique to each project. The proposed projects will be monitored independently of one another by each state. Each monitoring plan is tailored to the specifics of each project. Given the differences in each proposed project, the proposed monitoring plans differ.

79. Comment: All natural methods such as marsh grass planting or oyster shell should be exhausted before breakwaters using hard armoring are used in the Living Shorelines projects to avoid damaging the environment, damaging marine life, and causing boating accidents.

Response: The Alabama living shoreline projects' impacts have been analyzed during the NEPA process. The projects' engineering and design is not complete at this point in the planning stage. However, when the proposed projects reach the engineering and design phase, impacts to marine life, the environment and safety will continue to be taken into account.

15.6.3 Point aux Pins (PAP) Living Shorelines

80. Comment: Support was expressed for the cumulative impacts analysis of the PAP Living Shoreline project.

    Response: The Trustees acknowledge this support.

81. Comment: "It is inappropriate to ascribe offsets for the Point aux Pins Living Shoreline Project to offsets reserved for injuries to federal waters on the Continental shelf, however, in the event that unused credits are applied to federal waters, the weighting of offsets should be scientifically defensible.

    Response: Application of offsets will be applied first to injury in Alabama waters and then, only if that injury in Alabama waters is exhausted, to Federal Waters of the continental shelf. The agreed upon conversion rates for translating offsets from one metric to another are based on information from scientific publications.

15.6.4 Shell Belt and Coden Belt Roads Living Shoreline

82. Comment: Support was expressed for the cumulative impacts analysis of the Coden Belt LS project.

    Response: The Trustees acknowledge this support.

83. Comment: The statement of Performance Criterion on Page 64 is different than stated on Page 66. Is the performance criterion 90% presence/absence of infauna/epifauna organisms or 90% have coverage of invertebrate infauna and epifauna of breakwater units? Which is the correct criterion and what is the basis for this criterion?

    Response: The language on page 66 is correct. So page 64 should be changed to read "Performance Criterion: At year 5, 90% of breakwater units have infaunal and epifaunal organisms present." The criterion is based on best professional judgment.

84. Comment: What is the basis for75% survival of marsh plantings?

    Response: 75% survival of marsh plantings is a standard construction contract criterion.

15.7 Department of the Interior

15.7.1 Bike and Pedestrian Use Enhancements at Davis Bayou, Gulf Islands National Seashore

85. Comment: Commenter(s) expressed support for the cumulative impacts analysis of the DOI bike path project.

    Response: The Trustees acknowledge this support.

86. Comment: Commenter(s) expressed concern about the environmental impacts of the paved surfaces created from the DOI Bike Path project.

Response: The Trustees evaluated the potential impacts and concluded that impacts of the project to water quality would be minor. Pollutant runoff from vehicles should not appreciably increase because of this project, as vehicle use is not expected to increase even though paved surfaces will increase. Runoff is expected to enter adjacent areas as it does currently, i.e. mostly evenly all along the road edge; as such, impact from increased runoff should be minor.

Mitigation projects are planned to address impacts to palustrine (forested, scrub-shrub, emergent) and estuarine intertidal emergent wetlands. These projects were developed further since the DERP was released; updated descriptions are given in the Phase IV Final ERP/EA.

87. Comment: Commenter(s) expressed support for the Bike Path project.

Response: The Trustees acknowledge this support.

88. Comment: Commenter(s) expressed concerns about the use of Phase IV funding for the Bike Path project, citing the amount of funding, absence of nexus to a direct injury from the spill, and the failure of the project to restore or protect natural resources.

Response: The OPA NRDA regulations (15 CFR Part 990) define natural resource injuries to include loss of use of a resource. Recreational losses were widespread, significant, and directly related to the spill throughout the Gulf, including Gulf Islands National Seashore; therefore, as described in detail in the Phase III ERP/PEIS, from which this Phase IV ERP/EA tiers, restoring recreational loss is important component of Early Restoration. As discussed in the Phase IV ERP/EA, the project will provide habitat benefits by increasing the capacity under East Stark Bayou Bridge for greater water flows. Trustees determined the size and cost of the project is cost-effective as discussed in the Phase IV ERP/EA.

15.7.2 Bon Secour National Wildlife Refuge Trail Enhancement

89. Comment: Commenter(s) expressed support for the cumulative impacts analysis of the Bon Secour project.

Response: The Trustees acknowledge this support

15.7.3 Seagrass Recovery Project at Gulf Islands National Seashore

90. Comment: Commenter(s) questioned why only 0.02 acres was chosen for funding for the DOI Seagrass project when there is significant damage to seagrass throughout Gulf Islands National Seashore (GUIS) in Mississippi and Florida.

Response: The Trustees agree that additional restoration activities are necessary to restore seagrass throughout GUIS. For purposes of the early restoration process, the Trustees identified 0.02 acres of seagrass restoration at Gulf Islands National Seashore, Florida District as an incremental, but important contribution to seagrass restoration at GUIS. The Trustees have also undertaken other seagrass projects in several locations in Florida. DWH emergency seagrass restoration projects were completed in 2012 that included restoration in the

following locations: Big Lagoon, Santa Rosa Sound, Perdido Bay, Choctawhatchee Bay, St. Andrews Bay, St. George Sound, and Apalachee Bay. The Phase III ERP/PEIS also included an early restoration seagrass project in St. Joseph's Aquatic Preserve.

91. Comment: Commenter(s) expressed concern about the interaction of the Seagrass project with ongoing activities in Santa Rosa Sound.

    Response: This project seeks to restore seagrass beds due to response injury. Without restoration, the seagrass beds would continue to degrade. The harvest of seagrass transplant plugs for this project will follow established and field-verified techniques from the seagrass restoration literature to mitigate impacts from harvesting. This project does not include any dredging, has a very small footprint, and will require just a few days with a small crew in the field. Therefore the Trustees do not expect the impacts of this project to interact with other activities in Santa Rosa Sound, nor do they believe this project will set precedents related to seagrass in the Santa Rosa Sound area.

92. Comment: Commenter(s) expressed concern that the educational signage associated with the Seagrass project will be insufficient to mitigate human disturbance from fishing and foot traffic – the root cause of seagrass damage. Also suggested alternatives such as a dock.

    Response: The Trustees understand the concern that this project will not completely mitigate visitor impacts in the seagrass beds at Naval Live Oaks. Balancing visitor access and their impacts and natural resource preservation is an inherent struggle in park management. The Trustees believe signage educating the public about the seagrass recovery project will enable to public to make informed decisions about avoiding the area where the project will occur. Because this area is well used by visitors and suffers from heavy visitor use impacts, without a restoration effort the seagrass beds in this area will continue to degrade. A dock would encourage even more visitors, and would likely kill any seagrass in its shadow.

93. Comment: Commenter(s) expressed concern that Seagrass donor sites will not recover from harvesting.

    Response: The harvest of seagrass transplant plugs for this project will follow established and field-verified successful techniques for seagrass transplants from the seagrass restoration literature. Those BMPs, which can be found in section 12.2.4.1 of this document, include maximum core size diameters, minimum shoots per square meter requirements for harvest areas, and minimum spacing intervals for transplant plugs. The transplant plugs will be harvested at such spacing and at such diameters that the donor beds are not anticipated to be harmed. The Trustees believe applying these BMPs will ensure the maximum success of the project.

94. Comment: Commenter(s) expressed concern about the precedence associated with removing seagrass from one area for deposit in another, within Santa Rosa Sound.

    Response: The seagrass harvest and transplant areas are within the same area of interest at NLO, which is an area of approximately 0.5 miles x 2.25 miles. Care would be taken to harvest

donor plugs from the healthiest beds and from optimal locations based on BMPs found in the seagrass restoration literature, discussed above in section 12.2.4.1. This harvesting strategy will ensure that donor seagrass locations are not harmed and will remain healthy.

15.8 Gulf-wide

15.8.1 Sea Turtle Project:

95. Comment: Commenter(s) requested funding for non-profit turtle programs that work to protect Kemp's ridley sea turtles through habitat protection, beach monitoring and research.

    Response: The Trustees recognize the importance of continuing to work with stakeholders during development of the implementation details for the project. The Sea Turtle Early Restoration project includes specific project components designed to work directly with the various NGO sea turtle programs in Texas to support existing Sea Turtle Stranding and Salvage Network (STSSN) and nest monitoring work to protect Kemp's ridley and other sea turtle species.

96. Comment: Commenter(s) requested that the Trustees "expand their consideration of cumulative impacts to turtles and … allow the public access to monitoring data to ensure public understanding and evaluation."

    Response: The Trustees believe the information provided is sufficient to inform the public about the cumulative impacts to sea turtles and to allow members of the public to provide meaningful comment on the proposed project. However, in finalizing the Sea Turtle project chapter, the Trustees have updated the cumulative effects analysis with some additional information to help clarify anticipated effects on, and benefits to, affected resources. The Trustees will be making information on the results of project activities, including monitoring data, available to the public in the future (e.g. through the restoration Project Atlas: http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/early-restoration-projects-atlas/).

97. Comment: The Trustees should revise the cumulative impacts analysis to describe additional threats to Gulf sea turtles that were identified earlier in the document, such as poor water quality, marine debris and changing ocean conditions (e.g., increased sea surface temperatures and ocean acidification). The cumulative impacts analysis should include a discussion on beneficial impacts to sea turtles from the Sea Turtle Early Restoration project as well as other DWH restoration funds.

    Response: The Trustees believe the information provided is sufficient to inform the public about the cumulative impacts to sea turtles and to allow members of the public to provide meaningful comment on the proposed Phase IV projects. However, in finalizing the Sea Turtle project chapter in the Final Phase IV ERP/EA, the Trustees have updated the cumulative effects analysis with additional information on water quality, marine debris and changing ocean conditions to help clarify the anticipated effects on and benefits to affected resources.

Although involved in separate processes with different responsibilities, the leaders of the various DWH restoration efforts have previously emphasized that they are coordinating with one another to ensure efforts fit together for the benefit of the Gulf environment and the people affected by the Spill.

98. Comment: Commenter(s) expressed support for the sea turtle project.

    Response: The Trustees acknowledge this support.

99. Comment: Commenter(s) requested that the sea turtle monitoring plan include a metric to track the release of turtles collected by the Texas Sea Turtle Stranding and Salvage Network.

    Response: The Texas STSSN currently tracks the release of sea turtles from rehabilitation. The Monitoring Plan for the Texas STSSN Enhancement project component has been updated in the Final Phase IV ERP/EA and includes a metric to track the disposition of all stranded sea turtles, including data on release of turtles following rehabilitation.

100. Comment: Project effort should not provide funding for hatchling release and incubation of Kemp's ridley sea turtles on the upper Texas Coast, north of Mustang Island. Perpetuating nesting through releases of hatchlings in areas other than those the turtles historically chose to nest in is not in the best interest of any sea turtle species. The project should focus on the historical nesting areas on Padre Island National Seashore (PAIS) and South Padre Island.

    Response: The Sea Turtle Early Restoration project includes a specific project component (i.e. Kemp's Ridley Sea Turtle Nest Detection and Enhancement)designed to protect Kemp's ridley nests in Texas, with a focus on where nesting most commonly occurs in Texas, PAIS and South Padre Island. However, the Trustees will provide support for nest detection and relocation on the upper Texas coast to maximize the number of sea turtle hatchlings that enter the Gulf of Mexico, which is important for the restoration of the species. The sea turtle restoration project activities in Texas, including the protection of nests along the Texas coastline are supported by the current Bi-National Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) (NMFS and USFWS, and Secretary of Environment and Natural Resources, Mexico [SEMARNAT] 2011).

101. Comment: Trustees need to work hard to ensure the survival of recently established and emergent Kemp's ridley nesting on the upper Texas coast.

    Response: The Sea Turtle Early Restoration project includes a specific project component (i.e. Kemp's Ridley Sea Turtle Nest Detection and Enhancement) to support nest detection and protection activities on Texas nesting beaches, including the Texas upper coast.

102. Comment: Commenter(s) requested that the Trustees reconsider the sea turtle funding allocation among the various components to favor nest detection and protection in Mexico, where most Kemp's Ridley sea turtles nesting occurs.

    Response: The Sea Turtle Early Restoration project includes a specific project component (i.e. Kemp's Ridley Sea Turtle Nest Detection and Enhancement) to support nest detection and protection efforts in Mexico. The Trustees recognize the importance of efforts to protect

Kemp's ridley nests along the Gulf Coast of Mexico. As indicated in the ERP, the Trustees are planning to spend a portion of the project's early restoration funding to support these efforts. However, the safeguarding of sea turtle nests along the Texas coast, the recovery of stranded sea turtles, and the protection of additional life stages by reducing by-catch related mortalities are also important to restore sea turtles that were lost.

103. Comment: Commenter(s) requested that the Trustees monitor changes in sea turtle populations. Population-level monitoring will allow the Trustees to evaluate if restoration actions are having the intended impact and to what degree.

    Response: Monitoring for Early Restoration projects is focused on the evaluation of the restoration project success, which will be monitored as described in the Monitoring Plans (updated) for this project found in Appendix B. Those plans are designed to assess success based on achievement of project goals and objectives. Data collected through the Sea Turtle Early Restoration project monitoring may be used by the USFWS and NOAA's National Marine Fisheries Service to inform population-level monitoring. Directed studies to monitor population trends are outside the scope of this early restoration project.

104. Comment: For the Sea Turtle Early Restoration project, the Trustees should identify specific, measureable recovery goals and set benchmarks for recovery.

    Response: The purpose of Early Restoration is to accelerate meaningful restoration of injured natural resources and their services resulting from the Spill while the natural resource damage assessment is ongoing. It would be premature to set specific restoration objectives outside the ongoing assessment. However, such objectives are more appropriately considered as part of the future comprehensive DARP.

    NRDA regulations designate several factors that should be included in monitoring plans in order to effectively gauge a project's progress and success, including restoration objective(s) and performance criteria. Monitoring for early restoration projects is focused on the evaluation of the restoration project success. The success of the Sea Turtle Early Restoration project will be monitored as described in the project Monitoring Plans (updated) found in Appendix B. Those plans are designed to assess success based on achievement of project goals and objectives. Recovery objectives for an endangered or threatened species are appropriately outlined in the Recovery Plan for that species, not through the NRDA process. The Sea Turtle Early Restoration project is consistent with specific recovery objectives and recovery actions that are identified in the Endangered Species Act Recovery Plans for the sea turtle species that were injured by the spill.

105. Comment: Commenter(s) requested money to implement any potential new TED requirements.

    Response: The Sea Turtle Early Restoration project does not involve the development of new TED regulations; rather it focuses on improving compliance with existing TED regulations through improving NOAA's capacity to provide education, outreach and assistance to the

shrimp trawl fishing community, and through increasing TPWD's TED enforcement effort in Texas waters.

Restoration planning is ongoing. The Trustees continue to receive and consider new ideas and proposals for potential DWH NRDA restoration projects. Project ideas can continue to be submitted and reviewed at http:www.gulfspillrestoration.noaa.gov/restoration/.

106. Comment: The Trustees' statement regarding "minor to moderate beneficial effects" is inconsistent with the characterization of the project being important to the Kemp's ridley population. For example, without the project, only 25% of PINS is readily accessible to survey teams. With the project, the remaining 75% of PINS can be readily surveyed. Further support that this proposed project will result in a greater benefit to the species than characterized in this section of the Draft Plan can be found in the long-term recovery plan for species of turtles in the GOM (i.e., Bi-National Recovery Plan for Kemp's Ridley Sea Turtles, NOAA 2011), which includes the same project components as this early restoration project. According to the Recovery Plan, these components are the type of projects that are expected to have the most significant benefits for the Gulf of Mexico sea turtle populations. As such, please explain the characterization of benefits as "minor to moderate" compared to the projects described in the Recovery Plan which presumably would be receiving public funding.

    Response: The entirety of the PAIS shoreline is currently surveyed for sea turtle nesting. The proposed cabins will make the survey efforts safer and more efficient. The ability to influence sea turtle recovery across the Gulf of Mexico is challenging given the breadth of stressors that are affecting the population.

    A restoration planning document does not identify recovery goals for a listed species under the ESA; rather,it identifies only actions intended to restore resources or resource services that were lost. While resource recovery is not the focus of an early restoration plan, the proposed project will make meaningful progress toward restoration of sea turtles; that progress is expected to be a contributing part of the efforts needed to restore the species to pre-DWH conditions.

15.8.2 Pelagic Longline (PLL) Project

107. Comment: Project implementation for the PLL project should prioritize "educating, engaging and funding affected long-line fishermen in the gear transition."

    Response: The PLL Project will provide for the education and engagement of PLL fishermen, including assistance to effectively transition to alternative gears. Section 14.1.2 of the Phase IV ERP/EA outlines the provisioning of alternative gear to participating fishers, and further states, "As part of the project, technical extension services (research, outreach, and training on the use of the alternative gear types) would be provided to participants to educate users and tune alternative gear to maximize effectiveness."

108. Comment: Commenter(s) expressed support for the PLL project and monitoring.

    Response: The Trustees acknowledge this support.

109. Comment: The PLL project should "explore the feasibility and benefits of installing electronic monitoring equipment (e.g., cameras) on vessels participating in this project and using greenstick or buoy gear."

Response: As noted in section 14.1.5 of the Phase IV ERP/EA, electronic monitoring equipment has been installed on vessels in the Atlantic pelagic longline fishery in accordance with requirements under Amendment 7 to the 2006 Consolidated Atlantic Highly Migratory Species (HMS) Fisheries Management Plan (FMP). The Trustees continue to evaluate the potential feasibility and utility of electronic monitoring within the context of the monitoring plan for the project along with other available tools such as logbooks and fisheries observers.

110. Comment: The PLL project should "include additional information about the impacts of oil and dispersant exposure on small and large pelagic fish."

Response: The Trustees believe the preliminary assessment information presented in the Draft and Final Phase IV ERP/EA is appropriate for this stage of early restoration and is sufficient to support the PLL Project as proposed. Additional information about oil impacts to pelagic fish may be released in the future and more detailed findings of the injury assessment will be released as reports are finalized.

111. Comment: Commenter(s) noted that greenstick gear works, but is most successful/cost effective on smaller vessels. Requested help in transitioning to a smaller vessel.

Response: The Trustees will work with fishers participating in the PLL Project to help maximize the effectiveness and efficiency of the greenstick gear. As stated in section 14.1.2 of the Phase IV FERP/EA, technical extension services (research, outreach, and training on the use of the alternative gear types) will be provided to participants to educate users and tune alternative gear to maximize effectiveness. During the Phase IV early restoration project development process, the Trustees considered an alternative project component that provided for the exchange of PLL vessels for vessels specifically suited to the use of alternative gears. However, through the early restoration project selection process, this alternative was infeasible in the context of the Framework Agreement.

112. Comment: Commenter(s) expressed concern that the repose period of the PLL project may not be the best use of funds and may not provide a long-term, sustainable solution to fisheries protection.

Response: The PLL Project was proposed, as an early restoration project, to help restore fishery resources injured or lost as a result of the Spill, as part of the NRDA process being undertaken under OPA. Long-term fisheries management is not the purpose or focus of planning that occurs in the NRDA process. NOAA manages Atlantic HMS fisheries in accordance with the 2006 Consolidated Atlantic HMS FMP and its amendments under the authority of the Magnuson-Stevens Conservation and Management Act and the Atlantic Tunas Convention Act.

113. Comment: We need more information on the PLL project.

Response: The Trustees believe that the level of information presented in the Draft and Final Phase IV ERP/EAs is appropriate for this stage of restoration and is sufficient to support the PLL Project as proposed. The information contained sufficient detail for the public to understand the proposed implementation measures and their potential impacts. The Trustees recognize the importance of continuing to work with stakeholders during development of the implementation details for the project. As implementation planning proceeds, the implementing Trustee intends to hold meetings with targeted groups of PLL Project stakeholders to communicate information and receive additional input on the project's implementation details with the goal of maximizing the potential project benefits to stakeholders and resources while limiting adverse impacts.

15.9 References:

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Phase IV Early Restoration Plan Repositories

STATE	LIBRARY	ADDRESS	CITY	ZIP
AL	Dauphin Island Sea Laboratory, Admin Building	101 Bienville Boulevard	Dauphin Island	36528
AL	Thomas B. Norton Public Library	221 West 19th Ave.	Gulf Shores	36542
AL	ADCNR-State Lands Division Coastal Section Office	31115 5 Rivers Blvd.	Spanish Fort	36527
AL	Weeks Bay National Estuarine Research Reserve (NERR)	11300 US Highway 98	Fairhope	36532
AL	Mobile Public Library, West Regional Library	5555 Grelot Rd.	Mobile	36606
FL	Franklin County Public Library	29 Island Dr.	East Point	32328
FL	Okaloosa County Library	185 Miracle Strip Pkwy, SE	Ft. Walton	32548
FL	Panama City Beach Public Library	125000 Hutchison Blvd	Panama City Beach	32407
FL	Escambia Southwest Branch Library	12248 Gulf Beach Hwy	Pensacola	32507
FL	Wakulla County Library	4330 Crawfordville Hwy	Crawfordville	32327
FL	Walton County Library, Coastal Branch	437 Greenway Trail	Santa Rosa Beach	32459
FL	Santa Rosa County Clerk of Court, County Courthouse	5841 Gulf Breeze Pkwy	Gulf Breeze	32561
LA	St. Tammany Parish Library	310 W. 21st Ave	Covington	70433
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LA	New Orleans Public Library, Louisiana Division	219 Loyola Ave	New Orleans	70112
LA	East Baton Rouge Parish Library	7711 Goodwood Blvd.	Baton Rouge	70806
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MS	Vancleave Public Library	12604 Hwy 57	Vancleave	39565
MS	Hancock County Library System	312 Hwy 90	Bay St Louis	39520
MS	Gulfport Harrison County Library	1708 25th Ave.	Gulfport	39501
MS	Pass Christian Public Library	111 Hiern Ave.	Pass Christian	39567
MS	Orange Grove Branch Library	12031 Mobile Ave.	Gulfport	39503
MS	Kathleen McIlwain Public Library	2100 Library Ln.	Gautier	39553
MS	Pascagoula Public Library	3214 Pascagoula St.	Pascagoula	39567
MS	Moss Point City Library	4119 Bellview	Moss Point	39563
MS	Ocean Springs Municipal Library	525 Dewey Ave.	Ocean Springs	39564
MS	Kiln Public Library	17065 Hwy 603	Kiln	39556
MS	Margaret Sherry Memorial Library	2141 Popps Ferry Rd.	Biloxi	39532
MS	East Central Public Library	21801 Slider Rd.	Moss Point	39532
MS	D'Iberville Library	10274 3rd Ave.	D'Iberville	39532
MS	Mercy Housing & Human Development	1135 Ford St.	Gulfport	39507
MS	Center for Environmental and Economic Justice	336 Rodenberg Ave.	Biloxi	39531
MS	MS Coalition for Vietnamese-American Fisher Folks and Families	1636 Popps Ferry Rd., Suite 228	Biloxi	39532
MS	STEPS Coalition	610 Water Street	Biloxi	39530
MS	Gulf Islands National Seashore Visitors Center	3500 Park Road,	Ocean Springs	39564
TX	Jack K. Williams Library, Texas A&M University at Galveston	Texas A&M University at Galveston; Building #3010, 200 Seawolf Pkwy	Galveston, TX 77554	77554
TX	Port Arthur Public Library	4615 9th Ave.	Port Arthur, TX 77672	77672
TX	Library Tex A&M Corpus Christi	6300 Ocean Drive	Corpus Christi, TX	78412

Phase IV Early Restoration Plan List of Acronyms

ACRONYM	DEFINITION
ADA	Americans with Disabilities Act
ADCNR	Alabama Department of Conservation and Natural Resources
ADEM	Alabama Department of Environmental Management
ASA	American Sportfishing Association
ATCA	Atlantic Tunas Convention Act
BCR	Benefit-to-Cost Ratio
BGEPA	The Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMPs	Best Management Practices
BP	British Petroleum Exploration and Production Inc.
CAAA	Clean Air Act Amendments
CCC	Civilian Conservation Corps
CCP	Comprehensive Conservation Plan
CEQ	Council on Environmental Quality
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CPRA	Louisiana Coastal Protection and Restoration Authority
CPUE	Catch-Per-Unit Effort
CWA/RHA	Clean Water Act Section 404 and Rivers and Harbors Act
CZMA	Coastal Zone Management Act
Dkg-Ys	Discounted Kilogram Years
DOI	The United States Department of the Interior
DPS	Distinct Population Segment
DSAYs	Discounted Service Acre-Years
dw	Dressed Weight
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement

ACRONYM	DEFINITION
EMS	Electronic Monitoring System
EO	Executive Order
EPA	The United States Environmental Protection Agency
ESA	Endangered Species Act
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
Final Phase III ERP/PEIS	Final Programmatic and Phase III Early Restoration Plan and Early Restoration Programmatic Environmental Impact Statement
FMP	Fishery Management Plan
FWC	Florida Fish and Wildlife Conservation Commission
GBEP	Galveston Bay Estuary Program
GBNERR	Grand Bay National Estuarine Research Reserve
GCRL	University of Southern Mississippi Gulf Coast Research Laboratory
GHG	Greenhouse Gas
GIWW	Gulf Intracoastal Waterway
GMT	Gear Monitoring Team
GMFMC	Gulf of Mexico Fishery Management Council
GOM	Gulf of Mexico
GSA	Geological Survey of Alabama
GSMFC	Gulf States Marine Fisheries Commission
GUIS	Gulf Islands National Seashore
HAPC	Habitat Area of Particular Concern
HCD	National Marine Fisheries Service Habitat Conservation Division
HEA	Habitat Equivalency Analysis
HGB	Houston-Galveston-Brazoria Intrastate Air Quality Control Region
HMS	Highly Migratory Species
IBQ	Individual Bluefin Quota
ICCAT	International Commission for the Conservation of Atlantic Tunas
IPCC	The Intergovernmental Panel on Climate Change
ITS	Incidental Take Statement
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries

ACRONYM	DEFINITION
LOSCO	Louisiana Oil Spill Coordinator's Office
MASH	Mobile Aquatic Sea Turtle Holding
MBTA	Migratory Bird Treaty Act
MDEQ	Mississippi Department of Environmental Quality
MDMR	Mississippi Department of Marine Resources
MDWFP	Mississippi Department of Wildlife Fisheries and Parks
MHHW	Mean Higher High Water
MLLW	Mean Lower Low Water
MMPA	Marine Mammal Protection Act
MMTCO2E	Million Metric Tons Of CO2 Equivalents
MRB	Mississippi River Basin
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MTL	Mean Tidal Levels
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGO	Non-governmental Organization
NHPA	National Historic Preservation Act of 1966, as amended
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRDA	Natural Resources Damage Assessment
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
O_3	Surficial Ozone
OPA	Oil Pollution Act
OSHA	Occupational Safety and Health Administration
PAH(s)	Polycyclic Aromatic Hydrocarbons
PAIS	Padre Island National Seashore
PCE	Primary Constituent Element

ACRONYM	DEFINITION
PE	Professional Engineer
PEA	Programmatic Environmental Assessment
PEIS	Programmatic Environmental Impact Statement
Phase IV ERP/EA	Phase IV Early Restoration Plan and Environmental Assessments
PIT	Passive Integrated Transporter
PLL	Pelagic Longline
PM10	Fine Particulates With A Diameter Of 10 Micrometers Or Less
PM2.5	Fine Particulates With A Diameter Of 2.5 Micrometers Or Less
PPT	Parts Per Thousand
PVC	Polyvinyl chloride
REA	Resource Equivalency Analysis
RPA	Reasonable and Prudent Alternative
SAFE	Stock Assessment and Fisheries Evaluation
SAV	Submerged Aquatic Vegetation
SERO	NOAA Southeast Regional Office
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
STSSN	Sea Turtle Stranding and Salvage Network
SWIM	Surface Water Improvement and Management
TCEQ	Texas Commission on Environmental Quality
TED	Turtle Excluder Device
THC	Texas Historical Commission
TGLO	Texas General Land Office
TPWD	Texas Parks and Wildlife Department
UME	Unusual Mortality Event
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
UTV	Utility Terrain Vehicle
VMS	Vessel Monitoring System
WAUs	Wave Attenuation Units

Appendix A: Evaluation of Change to Phase III Early Restoration Project: Enhancement of Franklin County Parks and Boat Ramps – Eastpoint Fishing Pier Improvements Component (Florida)

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A.1 Introduction

The following analysis evaluates the changes to the following Final Phase III ERP/PEIS early restoration project: Enhancement of Franklin County Parks and Boat Ramps –Eastpoint Fishing Pier Improvements (Eastpoint Fishing Pier Improvements component) selected in the Record of Decision (ROD) for the Final Phase III ERP/PEIS. Section 9.2 of the ROD for the Final Phase III ERP/PEIS describes criteria the Trustees will consider to evaluate for material changes to any selected Phase III early restoration project to determine whether additional restoration planning and environmental review, including opportunity for public comment, is necessary. First, the Trustees will determine whether any change to the project is consistent with the environmental review in the Final Phase III ERP/PEIS or if there are substantial changes that are relevant to environmental concerns. Second, the Trustees will assess whether or not there are significant new circumstances or information relevant to environmental concerns not addressed in the impact analysis of the Final Phase III ERP/PEIS (40 C.F.R. § 1502.9 (c)). Third, the Trustees will evaluate whether changes to the project result in changes to the project description in the Final Phase III ERP/PEIS that affects their selection under Oil Pollution Act of 1990 (OPA). After considering these criteria in relation to the identified change, the Trustees have determined that the change to the Eastpoint Fishing Pier Improvements component does not impact the overall "Enhancement of Franklin County Parks and Boat Ramps" project objective (which is to enhance and/or increase recreational fishing and boating opportunities by improving two existing fishing piers, an existing boat launch facility, and an existing waterfront park), that the environmental consequences of the change to the Eastpoint Fishing Pier Improvements component will not be substantial, and that the change does not present significant new circumstances or information pursuant to the first two criteria. Consequently, the Trustees find the project change does not affect the Trustees' selection of the project under OPA or the environmental analysis under NEPA in the Final Phase III ERP/PEIS

A.2 Description of Project Change

The Final Phase III ERP/PEIS states that the work to be Eastpoint Fishing Pier in Franklin County includes constructing a restroom facility at the base of the public fishing pier, which will utilize a holding tank that would need to be pumped out regularly. In addition to the restroom facility, a kiosk describing fishing ethics, litter control, and the important resources surrounding the pier (primarily commercial oyster bars) would also be added.

The Trustees are modifying this project by designing the restroom facility with a holding tank (approximately 50 gallon) and grinder pump system, which will be connected to the existing sewer infrastructure approximately 2/3 of a mile away, instead of only utilizing a holding tank that would need to be pumped out regularly. The Trustees will dig a trench along and across a previously disturbed right-of-way alongside Highway 300 and Patton drive to construct the 2-3 inch sewer line, which will connect the restroom to the sewer infrastructure. The Trustees will work with Franklin County in obtaining all necessary permits that the project change requires before project implementation begins. The restroom will still be built at the base of the public fishing pier and the kiosk describing fishing ethics, litter control, and important resources surrounding the pier will still be constructed as well.

The project change to the Eastpoint Fishing Pier Improvements component does not impact the overall "Enhancement of Franklin County Parks and Boat Ramps" project objective, which is to enhance and/or increase recreational fishing and boating opportunities by improving two existing fishing piers, an existing boat launch facility, and an existing waterfront park.

A.3 Evaluation Criteria, Performance Criteria, Monitoring and Maintenance, Offsets, and Costs Update

The project change does not change the result of the analysis of the OPA evaluation criteria in the Final Phase III ERP/PEIS for the Eastpoint Fishing Pier Improvements component of the "Enhancement of Franklin County Parks and Boat Ramps" project. In particular the project change still meets the evaluation criteria established for OPA and the Framework Agreement. As a result of the *Deepwater Horizon* oil spill and related response actions, the public's access to and enjoyment of the natural resources along Florida's Panhandle was denied or severely restricted. The project change still intends to enhance and/or increase recreational fishing opportunities by improving the fishing pier. The project change will enhance and/or increase opportunities for the public's use and enjoyment of the natural resources, helping to offset adverse impacts to such uses caused by the Spill. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Section 6a-6c of the Framework Agreement.

The project change is technically feasible and uses proven techniques with established methods and documented results. Further, the project change can be implemented with minimal delay. Agencies have successfully completed projects of similar scope throughout Florida over many years, including in earlier phases of the Deepwater Horizon Early Restoration. For these reasons, the project change has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. The project change does not result in any material net change to the project's estimated costs as identified in the Final Phase III ERP/PEIS and so the project will still be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.66 of the Final Phase III ERP/PEIS, indicates that adverse impacts from the project will largely be minor, localized, and often of short duration. In addition, best management practices (BMPS) and measures to avoid or minimize adverse impacts described in section 12.66 of the Final Phase III ERP/PEIS will be implemented. As a result collateral injury will be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). The project change would not affect the determination of the project's effects in the Final Phase III ERP/PEIS and, further, is not anticipated to negatively affect regional ecological restoration and is therefore not inconsistent with the long-term restoration needs of the State of Florida. See Section 6d of the Framework Agreement.

Furthermore, the project change does not require or result in any change to the project's performance criteria, monitoring and maintenance, offsets or costs as currently provided in the Final Phase III

ERP/PEIS for the Eastpoint Fishing Pier Improvements component of the "Enhancement of Franklin County Parks and Boat Ramps" project.

A.4 Analysis of the Project Change to the Eastpoint Fishing Pier Improvements Component

This analysis covers the project change to the Eastpoint Fishing Pier Improvements component. The impacts of the project change are identified and analyzed. The broader environmental analyses of the "Enhancement of Franklin County Parks and Boat Ramps" project and these types of actions as a whole are discussed in the Final Phase III ERP/PEIS.

A.4.1 Project Location

The restroom facility location for the Eastpoint Fishing Pier Improvements component is the same as identified in the Final Phase III ERP/PEIS. See Figure A-1 which updates the scope of the project location to include the construction of a sewer pipe. All work for this project component will take place in developed upland areas. No in-water work will be required.

A.4.2 Construction and Installation

The Eastpoint Fishing Pier Improvements component is one of four components encompassed within the "Enhancement of Franklin County Parks and Boat Ramps" project. This analysis is only applicable to construction activities related to the Eastpoint Fishing Pier Improvements component. Currently, the Final Phase III ERP/PEIS states that the improvements include construction of a public restroom sewage holding tank that will be pumped out regularly. This analysis reflects the project change which will connect the public restrooms directly with the Franklin County sewer system. The Trustees will now build the project with a holding tank (approximately 50 gallon) and grinder pump system and will install approximately 2/3-mile length of 2 to 3 inch PVC or polyethylene pipe, which will connect the public restrooms with the existing Franklin County sewer infrastructure. The Trustees will dig a trench along and across a previously disturbed right-of-way alongside Highway 300 and Patton drive to construct and install the sewer line. The total estimated costs are the same.

A.4.3 Operations and Maintenance

As described in Final Phase III ERP/PEIS, Franklin County will be responsible for operation and maintenance of the new amenities and enhancements at the Eastpoint Fishing Pier. This analysis also identifies Franklin County as responsible for operations and maintenance of the connecting sewer line. The Trustees will work with Franklin County in obtaining all necessary permits that the project change requires before project implementation begins.

A.4.4 Affected Environment and Environmental Consequences

Under the National Environmental Policy Act, federal agencies must consider environmental impacts of their actions that include, among others, impacts on social, cultural, and economic resources, as well as

natural resources. The following sections describe the affected environment and environmental consequences impacted by the project change to the Eastpoint Fishing Pier Improvements component.

A.4.4.1 Affected Environment

The affected environments for each of the following subsections are the same as described in Enhancement of Franklin County Parks and Boat Ramps: Environmental Review, which is part of the Final Phase III ERP/PEIS.

A.4.4.1.1 Physical Environment

Geology and Substrates

Environmental Consequences

The project change will involve minor alterations to soils due to the placement of the sewer pipe. The ground disturbance will range between approximately 18-36 inches deep and 4-6 inches across in a previously disturbed right-of-way alongside Highway 300 and Patton drive. The excavation for the sewer pipe is temporary and all sewer pipes will be buried post-construction. Given that there will be no substantial change in uses at the project sites following implementation of the enhancement activities, it is anticipated there will be no long-term negative impacts to soils. The implementation of the project change will therefore result in short-term minor negative and long-term beneficial impacts on soils.

Figure A- 1. Location of the Eastpoint Fishing Pier Improvements component and sewer connection pipe



Air Quality and Greenhouse Gas Emissions

Environmental Consequences

The project change will require the use of a small excavator to lay the sewer pipe which will temporarily affect air quality in the project vicinity due to construction vehicle emissions. The excavator will be in use for no more than one week during project construction. BMPs will be employed to prevent, mitigate, and control potential air pollutants during project implementation. Any air quality impacts that will occur will be localized and short in duration. Therefore, any adverse impacts to air quality will be short-term and minor.

Engine exhaust from bulldozers, excavators, trucks, backhoes and other vehicles will contribute to an increase in greenhouse gases (GHG).Table A-1 describes the likely GHG emission scenario for the implementation of the entirety of the "Enhancement of Franklin County Parks and Boat Ramps" project.

Based on the assumptions described in Table A-1 below, and the small scale and short duration of the construction portion of the project, predicted GHG emissions will be short-term and minor and would not exceed 25,000 metric tons per year. Available BMPs will be employed to reduce the release of GHGs during implementation. Based on the small scale and short duration of the project, GHG emissions in the "Enhancement of Franklin County Parks and Boat Ramps" project staging and deployment areas will be minimal. Therefore, any increase in GHG emissions will be short-term and minor.

The project change will not impact overall GHG estimates for the "Enhancement of Franklin County Parks and Boat Ramps" project.

Noise

Environmental Consequences

The project change may expose sensitive park visitors and wildlife to noise sources during project construction due to the use of a small excavator. The project change will generate noise during the sewer pipe construction in the right-of-way along Highway 300 and Patton Drive. Construction equipment noise is known to disturb nesting shorebirds. Construction noise can also be a nuisance to residents living on the shorelines adjacent to project construction activities or to park visitors.

Mitigation measures that serve to limit noise during construction include: limiting activity at project sites to daytime hours; limiting truck traffic ingress/egress to the site to daytime hours; promoting awareness that producing prominent discrete tones and periodic noises (e.g., excessive dump truck gate banging) should be avoided as much as possible; and requiring that work crews seek pre-approval for any weekend activities, or activities outside of daytime hours. Because construction noise is temporary, any negative impacts to the human environment during construction activities will be short-term and minor.

Table A- 1. Greenhouse gas emissions estimates

PROJECT ACTIVITY	CONSTRUCTION EQUIPMENT	NO. OF HOURS OPERATED	NO. FOR PROJECT	TOTAL CO2E EMISSION RATE[1] (METRIC TONS)
Courtesy Docks, Boat Ramp, and Bulkhead Repair	Small barge w/ crane (pile driving)	8 hours/day, 5 days/week, 1 month	4	23.2 (used crane .29equipment for calculating total)
	tractor trailer (material delivery)	3 trips	4	4.1 (used dump truck .34)
	small power tools (nail guns, saws, drills	8 hr/day, 5 day/week, 4 month	4	51.2 (used pickup truck .16)
	generator (small tools)	8 hr/day, 5 day/week, 4 month	4	64 (used .8 as conversion)
Parking Improvements & Restrooms	Small tools (nail guns, saws, drills)	8 hr/day, 5 day/week, 6 months	3	14.4
	Tractor trailer (material delivery)	1 trip / week, 6 months	3	24.5
	generator (small tools)	8 hr/day, 5 day/week, 6 months	3	96
Total				277.4
Note: 1. Includes CO2, CH4, and NOx				

A.5 Analysis of Criteria for Changes to Phase III Early Restoration Projects

Pursuant to Section 9.2 of the ROD for the Final Phase III ERP/PEIS, the Trustees will review material project changes against three criteria. The first criterion is whether the project change is consistent with the environmental review in the Final Phase III ERP/PEIS. As discussed above in greater detail, while the installation of the sewer line will result in short-term minor negative impacts to geology and substrate, air quality and greenhouse gas emissions, and noise, these impacts are consistent with the detailed environmental review in the Final Phase III ERP/PEIS and will not change the overall impacts of the project. This ties into the second criteria of whether or not there are significant new circumstances or information relevant to environmental concerns not addressed in the impact analysis of the Final Phase III ERP/PEIS (40 C.F.R. § 1502.9(c)). As discussed above, the installation of the sewer line will only result in short-term minor negative impacts, which have already been addressed in the impact analysis of the Final Phase III ERP/PEIS. The installation of the sewer line does not create significant new circumstances or information that need to be addressed in the impact analysis of the Final Phase III ERP/PEIS. Therefore, the Trustees have determined that the environmental consequences of the project change to the Eastpoint Fishing Pier Improvement component will not be substantial and do not present significant new circumstances or information pursuant to the first two criteria.

The third criteria evaluates whether changes to the project result in changes to the project description in the Final Phase III ERP/PEIS that affects its selection under OPA. As discussed above in greater detail,

the nexus to resources injured by the Spill is addressed, since the project change will enhance and/or increase opportunities for the public's use and enjoyment of the natural resources, helping to offset adverse impacts to such uses caused by the Spill. Furthermore, the project change has a high likelihood of success since the installation of the sewer line is technically feasible and uses proven techniques with established methods and documented results. Additionally, the project change will be conducted at a reasonable cost since the installation of the sewer line instead of large holding tank doesn't increase the cost of the project. Moreover, collateral injury will be avoided and minimized since the project change doesn't change the adverse impacts of the project and BMPs will still be implemented. Finally, this project change is not inconsistent with the long-term restoration needs of the State of Florida, since the project change is not anticipated to negatively affect regional ecological restoration. Therefore, the Trustees have determined that the project change does not impact the overall "Enhancement of Franklin County Parks and Boat Ramps" project objective (which is to enhance and/or increase recreational fishing and boating opportunities by improving two existing fishing piers, an existing boat launch facility, and an existing waterfront park).

Based on this analysis, the Trustees find that the project change does not affects the Trustees' selection of the project under OPA or environmental analysis under NEPA in the Final Phase III ERP/PEIS.

A.6 Summary

The project change for the Enhancement of Franklin County Parks and Boat Ramps – Eastpoint Fishing Pier Improvements is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement project emphasizing the restoration of habitat and living coastal marine resources as well as projects emphasizing the restoration of recreational opportunities.

This analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resources categories, no moderate to major adverse impacts are anticipated to result. The project change to the Eastpoint Fishing Pier Improvements component will still enhance and/or increase recreational fishing opportunities by improving the existing Eastpoint Fishing Pier.

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B.1 Introduction

Monitoring plans for each of the proposed Phase IV projects are provided in this Appendix B. These plans were designed to evaluate the effectiveness of each of the proposed restoration actions in meeting the restoration objectives and to assist, where feasible, in determining the need for corrective actions. As applicable, these plans contain information on restoration objectives, performance criteria, specific monitoring parameters and methods to be used to collect data, and expected monitoring timelines. While the Trustees intend to strive for consistency in performance monitoring parameters, frequency, and duration for similar project types, flexibility in monitoring design is necessary to account for inherent differences between restoration projects and locations. Monitoring plans for most projects will be refined as project siting and design are finalized. In addition, for those projects that will include biological and structural sampling in the natural environment, the specifics regarding sampling methods, timing, frequency, and locations could be modified to evaluate the established performance criteria.

Monitoring of Early Restoration projects may also include evaluation of project compliance with other laws (e.g., to address Endangered Species Act monitoring needs) or to assist future restoration planning related to the Spill.

B.2 Texas Rookery Islands

B.2.1 Introduction

The Trustees developed this monitoring plan (Plan) for the Texas Rookery Islands Project. This project is included as a Phase IV Deepwater Horizon early restoration project that is intended to contribute to making the environment and public whole for injuries to birds. The purpose of this plan is to describe monitoring activities that will be conducted to evaluate and document restoration effectiveness, including performance criteria for determining the success of restoration or need for interim corrective action (15 CFR §990.55(b)(1)(vii)). This monitoring plan is intended to be specific to this Early Restoration Project and should not be generalized beyond this project. Other monitoring plans and designs may be appropriate in other contexts or sites. The monitoring plan outlined here will be used for each island site: Smith Point Island, Dickinson Bay Island II, Rollover Island, and Dressing Point Island. Since each island will target specific bird species and is located in a different environment, the islands will be independently designed and constructed and may be managed by different Trustees or project partners. Information collected for each site will be maintained and evaluated separately on an annual basis. At the conclusion of the project, the Implementing Trustees will develop a final project summary which will detail the overall accomplishments of the entire project. This Plan will be implemented by Texas Trustees,[1] DOI and project partners and may be modified over time based on the management needs for the Projects.

This Plan is intended to apply to the performance monitoring activities included herein. The Trustees and BP Exploration & Production, Inc. ("BPXP") agree that they will include this Plan in the final Project Stipulation for the Texas Rookeries Project.

Project Overview

The Texas Rookery Islands Project would restore and protect three rookery islands in the Galveston Bay System and one rookery island in East Matagorda Bay. The Galveston Bay System islands include Dickinson Bay Island II, located within Dickinson Bay; Rollover Bay Island, located in East (Galveston) Bay; and Smith Point Island, located west of the Smith Point peninsula in Galveston Bay (Figure B- 1).

The purpose of the project is to improve the numbers of nesting birds and protect rookery islands in the Galveston Bay System and East Matagorda Bay. Restoration and protection of the rookery islands is needed to protect the islands from land loss associated with erosion and relative sea level rise. The

[1] The Texas Trustees include the Texas Commission on Environmental Quality, Texas General Land Office, and Texas Parks and Wildlife Department (TPWD).

project involves the restoration of former island habitat area and construction of protective features at each rookery island. The habitat improvements aim to increase nesting of colonial waterbirds by increasing the amount of available nesting habitat, enhancing the quality of habitat, and by increasing protection of the habitat from natural environmental processes (e.g., wave action).

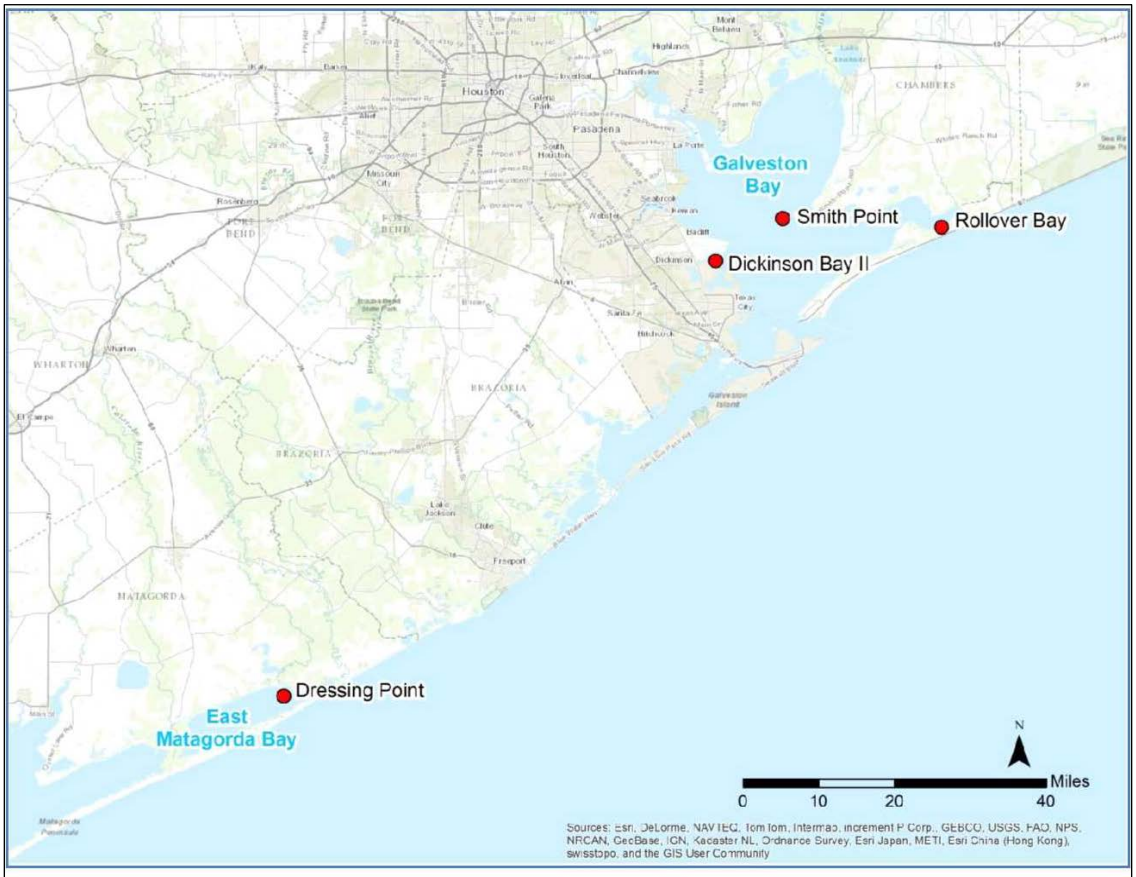


Figure 1. Location of Texas rookery island restoration projects.

Restoration Objectives and Performance Criteria

The specific restoration objectives relevant for this monitoring plan are to: (1) Restore and protect colonial waterbird nesting islands; (2) Establish native vegetation for platform nesting birds; and (3) Increase the numbers of nesting colonial waterbirds.

Performance criteria that will be used to determine restoration success, the need for corrective action (15 CFR 990.55(b)(1)(vii)), or adaptive management are described below:

- The project is constructed according to design specifications. At the end of the 5-year monitoring period, the infrastructure is stable and is performing as expected.
- Approximately 60% survival of planted vegetation at the end of the 5-year monitoring period.

- Increased numbers of nesting pairs of target species over the Performance Monitoring Period (5 years).

Roles and Responsibilities

The Texas Trustees and DOI are the Implementing Trustees for the Bird Rookery Islands Project. Each island site will have a project team that includes representatives of the relevant Implementing Trustees and organizational or NGO project partners for that site.

The Implementing Trustees will work with the partners participating in management of project activities and where appropriate to identify corrective actions needed to help achieve success. Corrective actions will be part of an adaptive management process in which the Implementing Trustees and Component partners will evaluate information obtained as part of this project and other projects or datasets to inform planning of future actions. This allows for flexibility to optimize performance of the efforts under changing conditions to achieve success.

The Implementing Trustees agree to implement this Project Monitoring Plan, and BPXP or its representative will be provided an opportunity to observe all aspects of the monitoring data collection to the greatest extent practicable under applicable laws based on Trustee safety requirements, permit conditions, Trustee knowledge of the scheduling of monitoring activities, and site-specific conditions. Implementing Trustees will make reasonable efforts to facilitate the ability of BPXP to observe data collection by third parties and provide the schedules of any such activities to BPXP promptly upon their receipt by the Trustees. Implementing Trustees agree to provide BPXP with the data and information generated under the Monitoring Plan, including raw data, as described in and in accordance with section 4.4 below.

B.2.2 Project Monitoring

The monitoring for this project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, sites, and performance criteria. Once construction of each site is completed, the project team for each island will begin Performance Monitoring.

The Implementing Trustees will evaluate the outcome of each year's activities to determine if any changes in monitoring protocols are needed. If changes are needed, the Trustees will update the Plan to describe any modifications. Any changes to procedures must be compliant with all active agreements. The Implementing Trustees will evaluate the submitted reports to determine if any changes in monitoring procedures are needed. If changes are needed, the Trustees will update the Project Monitoring Plan to describe any modifications. The activities involved with monitoring each objective are detailed below:

Restore and protect colonial waterbird nesting islands

- Did the project achieve its design criteria?

- Are the constructed structures (e.g., breakwater, levee, etc.) working as intended?
- What is the change in island size?

Activities associated with this objective are aimed at monitoring an island's physical dimensions and effectiveness of restoring the island's mass and protecting it from physical processes.

Physical infrastructure that supports suitable island nesting habitat (as-built) at each of the rookery island sites.

(1) Method:

(a) The Implementing Trustees will work with the project partners to review construction documents and will verify final construction. A final inspection and post construction as-built survey by a professional Engineer (PE)will be performed to document completion.

(b) Visual inspections of specific physical features or issues such as breakwaters or erosion to the site will be conducted. Field and aerial photography will be taken to document features and conditions. The photographs will focus on infrastructures and features created on the island. The first aerial image will coincide with the end of construction to establish an aerial image baseline. The image will be high resolution and digitally rectified.

(2) Timing and Frequency:

(a) Design criteria will be evaluated once at the completion of construction of physical infrastructure.

(b) After completion of the as-built survey, visual inspections, which include field photography, will be conducted at least once every year during the 5-year monitoring period. Each site will be visually inspected by members of the project team. Aerial photography will be obtained at least once a year for a total of 6 images.

(3) Sample Size: Construction area.

(4) Sites: Construction activities will occur at each rookery island site.

(5) Performance Criteria: The project is constructed according to design specifications. At the end of the 5-year monitoring period, the infrastructure is stable and is performing as expected.

(6) Data Products:

(a) As-built designs for the project, pre and post construction inspection reports, field and aerial photographs documenting features and conditions of the islands.

(b) Annual inspection reports and photographs

(c) A copy of the final construction report submitted by the professional engineer (PE), including a post construction as-built survey

Establish native vegetation for platform nesting birds

- Is target vegetation becoming established?

Planting survival

(1) Method: Field surveys which would result in an estimation of dominant species by area and an estimation of survival rate.

(2) Timing and Frequency: First year of planting: 6 survey events; Remaining monitoring period: 2 survey events per year.

(3) Sample Size: Survey entire restored or constructed area.

(4) Sites: All rookery island sites.

(5) Performance Criteria: Approximately 60% survival of planted vegetation at the end of the 5-year monitoring period.

(6) Data Products: Monitoring reports, including photographs, and replanting documentation if replanting is required

Vegetation distribution and/or planting survival.

(1) Method:

(a) The Project Team will develop a Vegetation Plan for each island that will be approved by the Implementing Trustees. The Vegetation Plan will contain specific requirements that would be met by a planting contractor including but not limited to items such as identifying the vegetation to be planted, the quantity of vegetation, by species to be planted, locations to be planted, survival criteria. This plan will utilize information provided in NRCS Guidance TX-612 (NRCS 2013) and will incorporate site specific modifications to account for coastal island conditions and scrub-shrub species. The Vegetation Plan will provide the contractor with specific targets in order to complete their contract. Once the vegetation contractor is finished, the project team will continue to use the plan throughout the remainder of the monitoring period.

(b) Project team members will conduct field surveys to ensure the contractor is meeting their obligations, document plant survival and health, and to obtain information needed to initiate timely corrective actions. Field surveys will document plant survival for each species planted, collect on-site photographs, and assess corrective actions if they may be deemed necessary. Soil salinities may also be measured to determine when soil salinity is appropriate for planting and/or if it is a factor in plant survival.

The field surveys will include documentation of natural colonization of the island by dominant plant species not actively planted by a contractor. Information collected will include species, distribution, and estimates of coverage or density.

(c) Aerial imagery will be obtained and rectified for each island site. The imagery will be reviewed for the status of the vegetation planted and for the natural colonizers. The imagery will be ground-truthed during the vegetation surveys. Estimates of coverage would be used to document the rate of vegetation establishment and provide location information that can be checked against field observations.

(d) Field photography will focus on the vegetation present.

(2) Timing and Frequency:

(a) The Vegetation Plan will be developed prior to planting activities.

(b) Field surveys will be conducted 6 times in the first year after planting. This is considered the most vulnerable period for survival. This increased survey effort would help identify needed corrective actions/adaptive management. For the remainder of the monitoring period, 2 surveys will be conducted each year to assess island vegetation.

(c) Aerial imagery will be obtained and evaluated once annually for 5 years (for a total of 6 aerial images).

(d) Field Photography will be conducted during the habitat monitoring activities (approximately 14 survey events).

(3) Sample Size: Survey entire restored or constructed area.

(4) Sites: All rookery island sites.

(5) Performance Criteria: TBA. Each island will have its own Vegetation Planting Plan which will specify performance criteria for the project. The current expectation for survival is approximately 60% for the planted scrub-shrub plants at the end of the 5-year monitoring period. The Vegetation Plan for each island will be developed prior to any planting activities.

(6) Data Products:

(a) The Vegetation Plan for each island.

(b) Field survey data which would include metrics outlined in the Vegetation Plan such as qualitative information on plant health, estimates of plant survival, measures of soil salinities (if needed), natural colonization by dominant plant species, estimates of areal distribution, and photographs taken during each survey.

(c) Aerial images of the islands would be provided once annually to support information collected in the field.

Increase the numbers of nesting colonial nesting waterbirds

- Are the target birds, in expected numbers, nesting on the restored habitat?

Number of nesting pairs

(7) Method:

(a) Survey methodology will be consistent with that used by the Texas Colonial Waterbird Society surveys (Damude 2000). A guidance document for surveys will be formalized prior to completion of infrastructure construction has been completed. In general, surveys will be implemented as follows:

(I) Surveys will be performed in early morning or late afternoon hours to avoid excessive temperature stress on eggs or young of potentially disturbed birds.

(II) Surveys will be performed from vessels adjacent to shoreline at static locations or by drifting. If conditions preclude these options, surveys will be conducted from fixed locations on the island edge. Observers will not intrude into any nesting area to perform counts.

(III) No less than a two member team representing the Implementing Trustees will perform each survey. Additional observers approved by the Implementing Trustees may accompany survey teams.

(IV) The survey team will assess safety, environmental, and island conditions and discuss specific approaches to implement the task prior to counting. For each static or drifting survey, each survey team member will count the estimated number of nesting pairs for all nesting species using similar estimating approaches and agree on a single value for each species.

(V) For each species counted, notes will be taken to document factors influencing estimate or how estimate was determined; e.g. black-crowned night heron – nesting site obscured, nest-building, number of adults/2 or tri-colored heron, single adult, nesting site fidelity, head count method.

(b) All species of nesting birds present will be recorded. Surveys will estimate the number of breeding pairs for each species using the island. General associations with particular locations and/or vegetation will be noted. Permanent geo-referenced visual markers will be placed on the islands to aid observers by partitioning sections of the island into virtual polygons and used to assist in determining associations between nesting location and vegetation.

(c) Each site may have fixed photographic stations that remotely record images during the nesting season. These would be installed prior to the onset of nesting activity and removed at the end of the most active part of the nesting season. Images collected would be used to better inform interactions between individuals and species at each site and document predation and or disturbance issues at each site. This activity will help guide adaptive management/corrective actions.

(d) Aerial imagery will be obtained and rectified for each island site. The imagery will be evaluated for information related to bird nesting at each site and used to support information collected during field surveys.

(e) Field photographs will be collected associated with each survey event at sufficient resolution to aid in refining estimates. It will also document any noteworthy activities related to nesting activities.

(8) Timing and Frequency:

(a) Nesting bird surveys will begin after vegetation planting has occurred. This monitoring will occur biannually in April and May for 5 years. Where existing, historical information on nesting birds will be obtained and summarized as part of pre-project monitoring activities.

(b) Fixed photography would capture images at appropriate intervals based on technology chosen.

(c) Aerial imagery will be obtained and evaluated once annually for 5 years (for a total of 6 aerial images).

(d) Field Photography will be conducted during each survey event(approximately 10 survey events).

(e) Sample Size: Observations on all nesting habitat.

(f) Sites: All rookery island sites.

(g) Performance Criteria: Increased numbers of nesting pairs of target species over the Performance Monitoring Period (5 years).

(h) Corrective Action: Implementing Trustees will evaluate survey methods and bird survey data results as well as other data included in the annual report and employ adaptive management techniques to address survey method improvements or actions that promote nesting as appropriate. For example, if birds fail to use the site prior to the advent of nesting season, Trustees may employ decoys and playbacks as attractants prior to the next nesting season.

(9) Data Products: Datasheets, field notes, field and aerial photographs, and GPS information.

Monitoring Frequency and Schedule

The schedule for the project monitoring is shown in Table B- 1, separated by monitoring activity. The frequency of the sampling events per year is presented within each cell. Post-construction monitoring will occur as the various construction components (defined in the work contracts) are finalized. After construction completion, a professional Engineer (PE) will perform a final inspection and submit a final construction report, including a post construction as-built survey to document final completion. Performance monitoring will begin after receipt of the construction completion report and after vegetation planting. Performance monitoring will occur annually following project construction (Years 1-5) after vegetation planting has been completed. The occurrence of a significant storm event may initiate additional ad-hoc surveys. Any adaptive measures will be documented and coordinated with the Implementing Trustees.

Table B- 1. Anticipated monitoring frequency and schedule.

Monitoring Activity	Post-Construction Monitoring	Performance Monitoring				
		Year 1	Year 2	Year 3	Year 4	Year 5
As-built survey of island area and features	1X	---	---	---	---	---
Post-construction field inspection of the physical infrastructure	1X	1X	1X	1X	1X	1X
Vegetation Plan	1X	---	---	---	---	---
Vegetation surveys	---	6X	2X	2X	2X	2X
Nesting bird surveys	---	2X	2X	2X	2X	2X
Fixed photography	---	Varied	Varied	Varied	Varied	Varied
Aerial imagery	1X	1X	1X	1X	1X	1X
Field photography	1X	9X	4X	4X	4X	4X

B.2.3 Reporting and Data Requirements

This section describes the process that will be used to document, validate and report field data collected for the purposes of performance monitoring. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data;
- Organize, track, locate, and access monitoring data over the long-term; and
- Share finalized monitoring data with the public in a consistent and comprehensible format.

Reporting

Annual reports will summarize the activities described above including results, expenses, and document the degree to which the project is progressing. For the purposes of the annual reporting, a reporting year will cover from January 1st to December 31st. The first annual report will cover the year following the receipt of funding. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. Each island will be evaluated in a separate chapter within the report. Information related to any corrective actions taken will be included in the report.

The reports should provide a summary of the previous annual report (including timelines documenting monitoring procedures) as well as summary information for the most recent monitoring year. Reported data and all data that is available to the public will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information. The Implementing Trustees will develop a final project summary report at the conclusion of the project which will detail the overall accomplishments of the project.

Data Documentation

The majority of data collected during the monitoring portion of this project will be field observations of infrastructure, photography, observations of birds using and nesting in the project area, and the distribution of dominant vegetation and survival of planted vegetation. To the extent possible, all environmental and biological data generated during monitoring activities will be documented using field datasheets which have been approved by the Implementing Trustees, and which will be made available to BPXP. The bird monitoring datasheets will be modified from the standard datasheets used for the Texas Colonial Waterbird Society Survey Data Collection (Appendix A). Other additional datasheets may be developed for this project. All project-specific datasheets will be drafted prior to conducting monitoring activities and will be attached to an updated version of this Monitoring Plan.

All data available to the public will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information. Field data will be reviewed by the Implementing Trustees for completeness and accuracy before being finalized. Original hardcopy datasheets and photographs will be retained by the Implementing Trustee in a secure location in accordance with litigation-hold and other agency and Trustee requirements. All validated datasets and aggregated data will be retained by the Implementing Trustees and made available to BPXP.

Data Transcription, Verification, Validation, and Analysis

Where and when applicable field datasheets and notes will be scanned to PDF files and will be archived along with the original hardcopies. Electronic data files should be named with the date on which the file was created. Where possible, a ReadMe file should be included that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved. Relevant project data will be transcribed (entered) into Excel spreadsheets (or similar agreed upon digital format) for required data analysis and reporting.

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic database, spreadsheet, or other agreed upon electronic format against the hardcopy datasheets, and will make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. After identified errors are addressed, data are considered to be validated.

When the data transcription process is complete, electronic datasets can be used for data analysis and reporting. Analyses will be conducted by the Implementing Trustees to derive Project monitoring performance criteria metrics. All data will be (1) entered or converted into agreed upon/commonly used digital format and (2) stored and managed in a secure location in such a way that the Implementing Trustee is guaranteed to have access to all versions of the data at least as long as Trustee retention requires and during the entire period of litigation hold.

Data Sharing

The Trustees agree to provide BPXP with all data and information in the Trustees' possession or control generated by the Project Monitoring activities described above.

The phrase "all data and information" used in paragraph 4.4.1 above includes: all field data, e.g., measurements, observational data, and field notes; laboratory toxicity testing; any other laboratory data; spatial data; photographs; videos; images; and any other data and information generated by an activity, including field-collected metadata.

The Implementing Trustees will provide all raw data to BPXP, including all field datasheets, photographs and aerial photography, within 30 days of receipt by the Trustees of the data. Raw data will be subject the following limitations on public use and disclosure:

BPXP will keep the raw data provided pursuant to this plan confidential, and will require that any BPXP consultants, experts or employees who review the data agree to keep the materials confidential.

BPXP will not publish any studies based on the raw data provided pursuant to this plan, unless the data has been made publicly available.

Notwithstanding the terms of paragraphs 4.4.3.1 and 4.4.3.2 above, BPXP may use the raw data provided pursuant to this plan:

(a) In any legal or administrative proceedings relating to the Incident, including but not limited to, the NRDA of the Incident or MDL No. 2179 in the United States District Court for the Eastern District of Louisiana; and

(b) In a public discussion or disclosure of the raw data that is made in response to Trustee or third party public statements about these activities, or results of the activities that produced the raw data, provided, however, that BPXP will notify the Implementing Trustees at least seven (7) days prior to using the data the extent such data has not been previously made public.

(c) Any use, discussion or disclosure of the unvalidated data shall be accompanied by a statement that the data is "preliminary."

To the extent that the Implementing Trustees validate some or all of the raw datasheets provided under Paragraph 4.4.3, the Implementing Trustees shall provide BPXP with validated datasheets within 30 days of their production to BPXP of the unvalidated datasheets.

Nothing in this plan shall be construed as a waiver of any party's right to object to the admissibility or relevance of data produced under this plan, and each party reserves the right to undertake its own analysis and interpretation of the data.

B.2.4 References

Damude, N. and M LeNoir. 2000. Texas Audubon Society Colonial Waterbird Survey Training Manual. Report to The Coastal Coordination Council. NOAA Award No. NA97OZ0179.

Natural Resource Conservation Publication (NRCS). 2013. Conservation Practice General Specifications: Tree/Shrub Establishment Acres Code 612. Report No. NRCS TX-612

APPENDIX A: EXAMPLE BIRD SURVEY FIELD DATA FORM

Document will be modified and updated prior to initiation

of field surveys

TEXAS WATERBIRD COLONY CENSUS FORM

COLONY NAME: _____ **COLONY CODE:** _____

SURVEY DATE: ___/___/___
Mo Day Year

LATITUDE: _____ LONGITUDE: _____

☐ NEW COLONY
☐ PREV. KNOWN COLONY (COUNT + DESCRIP. UPDATE)
☐ PREV. KNOWN COLONY (COUNT ONLY)

SURVEYED, INACTIVE ☐
SURVEYED, ACTIVE ☐

OBSERVER(S): Main: _____

TIME: start _____ Military Format

end _____

SURVEY VANTAGE POINT:
☐ AERIAL
☐ ON-SITE VISIT
☐ VIEW FROM ADJACENT AREA BY VEHICLE/BOAT/ON FOOT

CENSUS PARTICIPANTS

Please be as complete as possible, particularly:
1. Review form guidelines prior to census.
2. Fill in/check mark all information in top section, side 1.
3. Always provide "**Number of Adults**" data for active colonies.
4. Give updated site description data on side 2 whenever changes are detected.

	Predominant Reprod. Stage (enter 1 code)	Survey Type (enter code) Nests	Survey Type (enter code) Adults	No. Active Nests	No. Adults	Est. Breed. Pairs
White Pelican						
Brown Pelican						
Dbl.-cr. Cormorant						
Neotrop. Cormorant						
Anhinga						
Great Blue Heron						
Great Egret						
Snowy Egret						
Little Blue Heron						
Tricolored Heron						
Reddish Egret						
Red morph						
White morph						
Cattle Egret						
Bl.-cr. Night Heron						
Y.-cr. Night Heron						
White Ibis						
White-faced Ibis						
Roseate Spoonbill						
Laughing Gull						
Gull-billed Tern						
Caspian Tern						
Royal Tern						
Sandwich Tern						
Forster's Tern						
Least Tern						
Sooty Tern						
Black Skimmer						

Prenesting = 1
Eggs in Nests = 3
Nestlings = 7
Recent Fledglings = 8
Post nesting = 22

Total Count = 1
Visual Estimate = 8
Other = 0 specify in comments
Sampling Process = 6

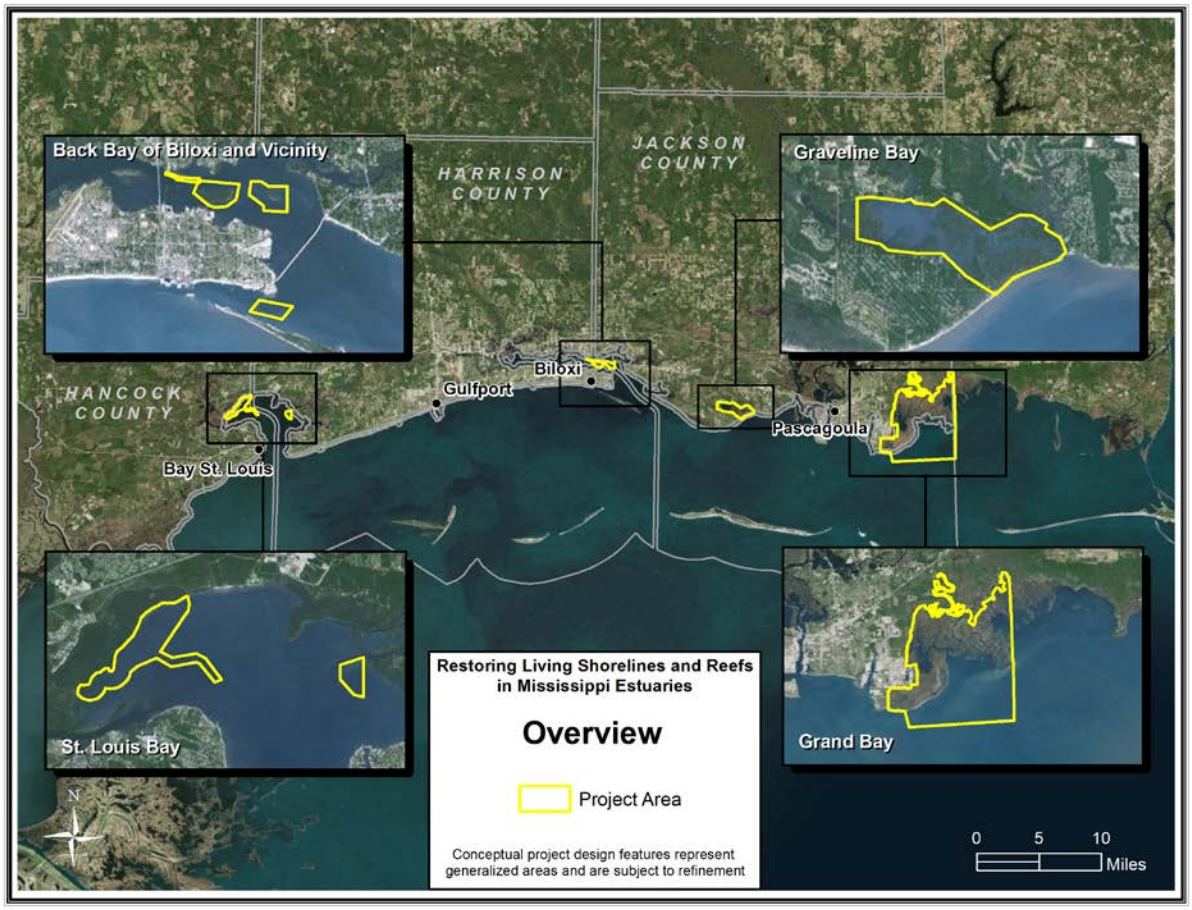
COMMENTS: _____

B.3 Restoring Living Shorelines and Reefs in Mississippi Estuaries

B.3.1 Introduction

The proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries includes the restoration of secondary productivity through the placement of intertidal and subtidal reefs and the use of living shoreline techniques including breakwaters. Projects are proposed in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay in Jackson, Harrison, and Hancock Counties, Mississippi. The project builds on recent collaborative projects implemented by Mississippi Department of Marine Resources (MDMR), National Oceanic and Atmospheric Administration (NOAA), and The Nature Conservancy. When completed at all locations, the project would provide for construction of over four (4) miles of breakwaters, five (5) acres of intertidal reef habitat and 267 acres of subtidal reef habitat at four (4) locations across the Mississippi Gulf Coast (Figure B- 1). For the Grand Bay and Graveline Bay project locations, intertidal and subtidal reefs would be created in a number of sites. Over time, the breakwaters, intertidal and subtidal restoration areas would develop into living reefs that support benthic secondary productivity, including, but not limited to oysters/bivalve mollusks, annelid worms, shrimp, and crabs. Breakwaters would reduce shoreline erosion as well as marsh loss. This monitoring plan provides [project monitoring] guidelines including parameters and performance criteria by restoration objective, based on the project's current conceptual design.

Figure B- 1. Restoring Living Shorelines and Reefs in Mississippi Estuaries-Vicinity Map depicting Project Locations and Project Areas[2]



The monitoring plan will be refined as the project siting and design is finalized. In addition, due to the nature of biological and structural sampling in the natural environment, sampling techniques, timing, frequency, and locations could be modified in order to evaluate the established performance criteria.

This monitoring plan is specific to this Early Restoration Project and should not be generalized beyond this project. Other monitoring plans and designs may be appropriate in other contexts or projects.

[2] Project areas encompass the project components, the direct restoration measures and potential areas for construction or indirect impacts. Conceptual design features (breakwaters, intertidal reef habitat, subtidal reef habitat, and temporary flotation channels) are subject to refinement and could be sited within respective project areas.

B.3.1.1 Project Overview

The project components[3] are grouped into four project locations. The project components are located in Grand Bay, Graveline Bay, Back Bay of Biloxi, and St. Louis Bay. For this project, the living shoreline approach includes constructing breakwaters made of suitable manufactured and/or natural materials that reduce shoreline erosion by dampening wave energy while encouraging reestablishment of habitat that was once present in the region. Breakwaters would develop into reefs that support secondary productivity (living reefs). Subtidal and intertidal reefs would be built using suitable cultch material (e.g. limestone, crushed concrete, oyster shell or a combination thereof). Some sites would be built to complement existing restoration sites constructed by MDMR, NOAA, and The Nature Conservancy projects funded through the NOAA Community-based Restoration Program. The following proposed early restoration project components are listed in Table B- 2, shown in Figures B-2 to B-9, and are described below.

Table B- 2. Restoring Living Shorelines and Reefs in Mississippi Estuaries-Project Components

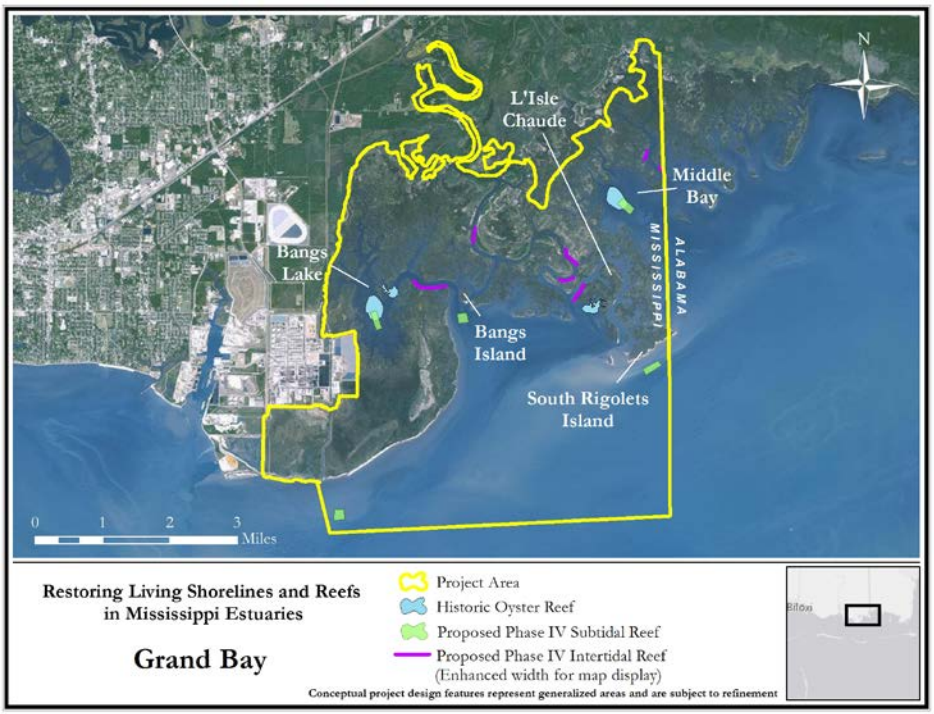
Project Components	Breakwater Structure Length (feet)	Subtidal Reef Habitat (acres)	Intertidal Reef Habitat (acres)
Grand Bay and Graveline Bayou (Jackson County)			
Grand Bay Intertidal and Subtidal Reefs		77	3
Graveline Bay Intertidal and Subtidal Reefs		70	2
Back Bay of Biloxi and Vicinity (Jackson and Harrison County)			
Channel Island Living Shoreline and Subtidal Reefs	2,385	70	-
Big Island Living Shoreline	5,011	-	-
Little Island Living Shoreline	2,316	-	-
Deer Island Subtidal Reef	-	20	-
St. Louis Bay (Harrison and Hancock County)			
Wolf River Living Shoreline and Subtidal Reef	1,388	30	-
St. Louis Bay Living Shoreline	10,812	-	-
TOTAL	21,912 feet 4.1 miles	267 acres	5 acres

[3] For the purpose of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Phase IV project components are located in eight locations across the Mississippi Gulf Coast and include some combination of the following restoration measures; intertidal reef habitat restoration; subtidal reef habitat restoration and breakwater construction. Grand Bay and Graveline Bay are each considered a project location with numerous intertidal and subtidal reefs sites.

Grand Bay Project Component (Jackson County)

Grand Bay Intertidal and Subtidal Reefs (Figure B- 2): The Grand Bay Intertidal and Subtidal Reefs project component would restore approximately three (3) acres of intertidal reefs in the intertidal waterways of Grand Bay. Approximately 77 acres of subtidal reef habitat would be restored in the nearshore environment of Grand Bay. Conceptual site locations for the intertidal and subtidal reefs are depicted in Figure B- 2 and are subject to refinement.

Figure B- 2. Grand Bay Intertidal and Subtidal Reefs Project Area



Graveline Bay Project Component (Jackson County)

Graveline Bay Intertidal and Subtidal Reefs (Figure B- 3): The Graveline Bay Intertidal and Subtidal Reefs project component would restore approximately two (2) acres of intertidal reefs along the intertidal waterways of Graveline Bay. Approximately 70 acres of subtidal reef habitat would be restored in the nearshore environment of Graveline Bay. Conceptual site locations for the intertidal and subtidal reefs are depicted in Figure B- 3 and are subject to refinement.

Figure B- 3. Graveline Bay Intertidal and Subtidal Reefs Project Area

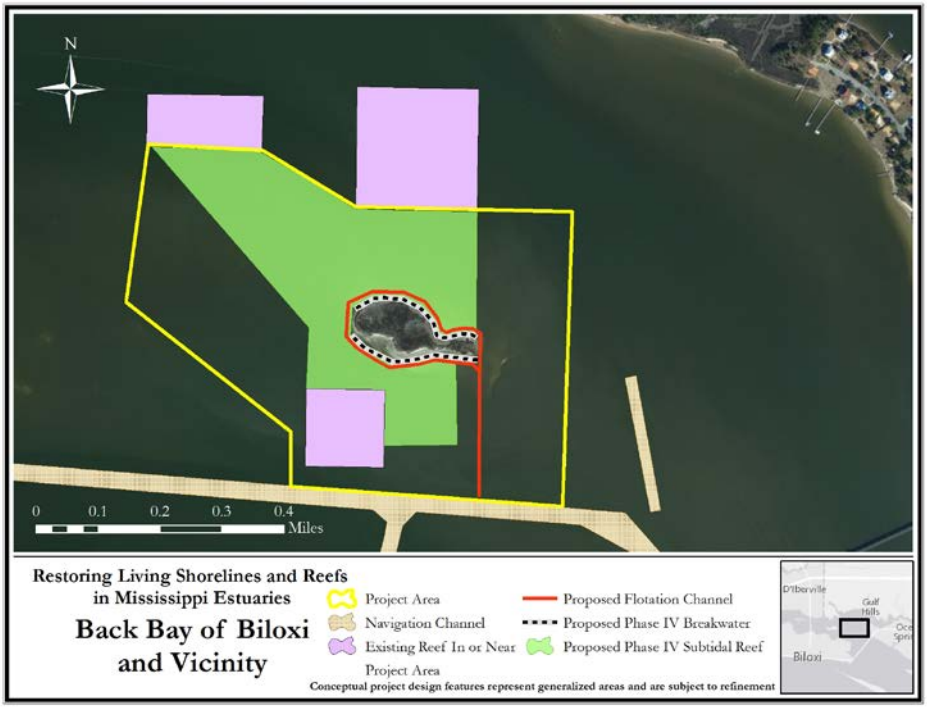


Back Bay of Biloxi and Vicinity Project Components (Jackson and Harrison County)

Back Bay of Biloxi and vicinity would have four (4) project components located along islands within Back Bay of Biloxi, which currently experience erosion, and along Deer Island to the south of Back Bay of Biloxi. Using living shoreline techniques, such as breakwater or intertidal shoreline stabilization, erosion rates would be reduced along approximately 1.8 miles of marsh island shoreline in Back Bay of Biloxi. Approximately 90 acres of subtidal reef habitat would be restored at locations in Back Bay of Biloxi and in the vicinity on the north side of Deer Island, adjacent to current reef projects.

Channel Island Living Shoreline and Subtidal Reef (Figure B- 4): Would include construction of approximately 2,385 ft. of breakwater along the shoreline. Approximately 70 acres of subtidal reef habitat would be created and would connect the breakwater structure to an existing subtidal reef on the north and south sides of the island. The conceptual site location for the breakwater, subtidal reefs and temporary flotation channels are depicted in Figure B- 4 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

Figure B- 4. Channel Island Living Shoreline and Subtidal Reefs Project Area



Big Island Living Shoreline (Figure B- 5): Would include construction of approximately 5,011 ft. of breakwater along the southern facing shoreline directly adjacent to the navigation channel. The conceptual site location for the breakwater and temporary flotation channels are depicted in Figure B- 5 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

Figure B- 5. Big Island Living Shoreline Project Area



Little Island Living Shoreline (Figure B-6): Would include construction of approximately 2,316 linear ft. of breakwater along the southern facing shoreline directly adjacent to the navigation channel. The conceptual site location for the breakwater and temporary flotation channels are depicted in Figure B-6 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

Figure B-6. Little Island Living Shoreline Project Area



Deer Island Subtidal Reef (Figure B- 7): Would expand an existing reef project at Deer Island to create approximately 20 acres of subtidal reef habitat. The conceptual site location for the subtidal reef is depicted in Figure B- 7 and is subject to refinement.

Figure B- 7. Deer Island Subtidal Reef Project Area



St. Louis Bay Project Components (Harrison and Hancock County)

St. Louis Bay would have two project components including approximately 2.3 miles of breakwater and approximately 30 acres of subtidal reef habitat restoration at two locations.

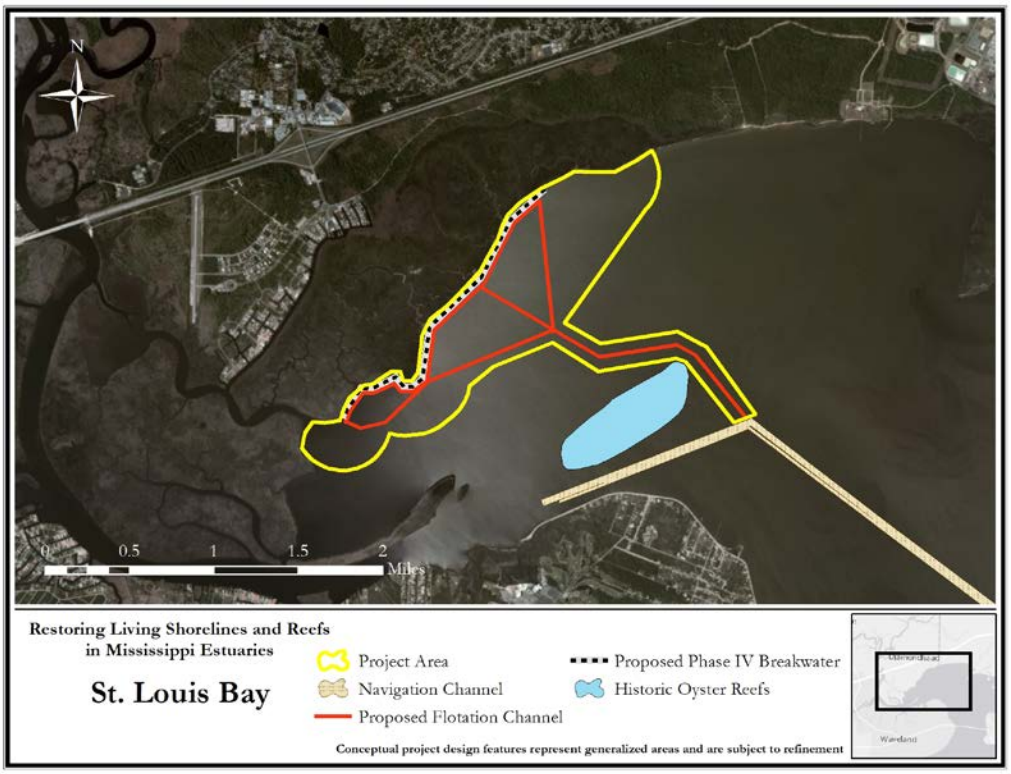
Wolf River Living Shoreline and Subtidal Reef (Figure B- 8): Would include construction of approximately 1,388 ft. of breakwater along the island at the mouth of the Wolf River in St. Louis Bay. This would also include construction of approximately 30 acres of subtidal reef habitat in St. Louis Bay, adjacent to current reef projects at mouth of Wolf River. Conceptual site locations for the breakwater, subtidal reefs and temporary flotation channels are depicted in Figure B- 8 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

Figure B- 8. Wolf River Living Shoreline and Subtidal Reef Project Area



St. Louis Bay Living Shoreline (Figure B- 9): Would include the construction of approximately 10,812 ft. of breakwater in St. Louis Bay. Conceptual site locations for the breakwater and temporary flotation channels are depicted in Figure B- 9 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

Figure B- 9. St. Louis Bay Living Shoreline Project Area



B.3.1.2 Restoration Objectives and Performance Criteria

There are two overall goals of this restoration project: 1) Construct breakwater structures to protect shoreline from erosion, to facilitate reef development, and to support secondary production, and 2) Restore subtidal and intertidal reefs to support secondary production. The specific restoration objectives for each goal are outline below.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). Since full recovery of restoration projects may occur over a long time frame, performance criteria typically represent interim milestones that will help project managers determine if the project is improving along an acceptable trajectory. The specific performance criteria for this project are identified below and shown in Table B- 3.

Goal 1: Construct breakwater structures to protect shoreline from erosion, to facilitate reef development, and to support secondary production

Objectives

1) Build breakwaters that are sustained for the expected lifespan of the project.
    a. Performance Criteria: Over five (5) years elevation and area meet the engineering design specifications.
2) Support habitat utilization of the breakwaters by invertebrate infauna and epifauna.
    a. Performance Criteria: Over five (5) years, the average infauna and epifauna invertebrate biomass is at least 84 g wet weight/ m^2
3) Reduce shoreline erosion.
    a. Performance Criteria: Over five (5) years there is reduction or no change in shoreline slope compared to pre-construction condition.
    b. Performance Criteria: Over five (5) years, the average shoreline erosion loss is less than the calculated average loss/year at specific site.

Goal 2: Restore subtidal and intertidal reefs to support secondary production

Objectives

4) Create or restore subtidal and intertidal reefs that are sustained for the expected lifespan of the project.
    a. Performance Criteria: Over five (5) years the total subtidal reef area is equal to or greater than 267 acres and the elevation meets engineering design specifications.
    b. Performance Criteria: Over five (5) years the total intertidal reef habitat is equal to or greater than 5 acres.

5) Support habitat utilization of subtidal reefs and intertidal reefs by invertebrate infauna and epifauna.
    a. Performance Criteria: Over five (5) years, the average infauna and epifauna invertebrate biomass is at least 84 g wet weight/m^2

Table B- 3. Performance Criteria for Restoring Living Shorelines and Reefs in MS Estuaries Project

Performance criteria	Construction	Post-Construction	
	Year 0 (as-built survey)	Year 3	Year 5
BREAKWATER			
Breakwater elevation	Meets design specifications		Meets design specifications
Breakwater area	Meets design specifications		Meets design specifications
Invertebrate infauna and epifauna		At least 84gww/m^2	At least 84gww/m^2
Shoreline profile/slope			Reduction or no change in slope
Marsh edge position			Loss is <average historic loss/year at site
SUBTIDAL AND INTERTIDAL REEFS			

Performance criteria	Construction	Post-Construction	
	Year 0 (as-built survey)	Year 3	Year 5
Subtidal Reef elevation and area	Meets design specifications		≥267 acres; Meet design specifications
Intertidal Reef area	Meets design specifications		≥ 5 acres
Invertebrate infauna and epifauna		At least 84gww/m^2	At least 84gww/m^2

B.3.1.3 Conceptual Model and Monitoring Questions

Table B- 4, below, outlines the conceptual model that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

Table B- 4. Conceptual Model for the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project

Activity	Output	Short-term outcome	Long-term outcome
• Construct breakwater structures parallel to shoreline	• 4.1 miles of shore-parallel reef structures are built	• Wave energy is dissipated • Shoreline erosion rate is reduced • Invertebrate infauna and epifauna colonize	• Breakwaters are sustained for the expected lifespan of the project • Wave energy is dissipated • Shoreline erosion rate is reduced • Breakwaters support a diverse benthic community
• Construct /restore subtidal and intertidal reef habitat	• 267 acres of subtidal reefs are built • 5 acres of intertidal reefs are built	• Invertebrate infauna and epifauna colonize	• Reefs are sustained for the expected lifespan of the project • Reefs support a diverse benthic community

This monitoring plan has been designed around the project's objectives and desired outcomes, and is intended to address the following monitoring questions for each objective:

<u>Objective #1: Build breakwaters that are sustained for the expected lifespan of the project</u>

- Did the project achieve its design criteria?
- Is the projected structure of the breakwaters being maintained?

Objective #2: Support habitat utilization of the breakwaters by invertebrate infauna and epifauna

- Are invertebrate infauna and epifauna colonizing the breakwater structures?
- What is the secondary productivity of invertebrate infauna and epifauna associated with the breakwater structures?

Objective #3: Reduce shoreline erosion

- Is shoreline erosion rate being reduced?

Objective #4: Create or restore subtidal and intertidal reefs that are sustained for the expected lifespan of the project

- Did the project achieve its design criteria?
- Is the projected structure of the reef being maintained?

Objective #5: Support habitat utilization of subtidal reefs and intertidal reefs by invertebrate infauna and epifauna.

- Are invertebrate infauna and epifauna colonizing the reef structures?
- What is the secondary productivity of invertebrate infauna and epifauna associated with the subtidal and intertidal reefs?

B.3.2 Project Monitoring

The proposed monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the potential monitoring methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified (if applicable), including corrective actions that may be taken if the performance criteria are not met. The timing and frequency as well as sample size provided here are the minimum suggested values. More frequent events or more samples will be performed or collected if budget allows.

GOAL 1, Objective #1: Build breakwaters that are sustained for the expected lifespan of the project

- Did the project achieve its design criteria?
- Is the projected structure of the breakwaters being maintained?

Parameter #1: Structural integrity of breakwater structure

a) Method: Conduct visual observations and take pictures of the project site from a boat or shoreline, or during an aerial survey.
b) Timing and Frequency: Post-construction (Opportunely, Years 0-5)[4].
c) Sample Size: Observations along entire length of reef structure.
d) Performance Criteria: None, this is a contract performance criterion.

Parameter #2-3: Breakwater height/elevation and area

a) Methods [list of potential options]: Several options for assessing breakwater height/elevation and area are proposed. Any or all of these methods could be used to determine whether the parameter is met depending on available budget. In addition, other methodologies, not included here, could be identified as project design is finalized.
    1. Method #1: Visual and field measurements;
    2. Method # 2: Acquisition of bathymetric and topographic (topobathy) data if budget allows
    3. Method #3: Conduct bathymetric/topographic survey using advanced surveying instrumentation (e.g., RTK GPS, Total Station) with cross-sections extending from the reef structures to low elevation marsh habitat. Potential method described by Baggett et al. (2013).
b) Timing and Frequency: Post-construction (Years 0 and 5).
c) Sample Size: TBD with final engineering and design
d) Performance Criteria: Over five (5) years elevation and area meet the engineering design specifications.
e) Corrective Action [as budget allows]: Add structural material to existing breakwater structure.

<u>GOAL 1, Objective #2: Support habitat utilization of the breakwaters by invertebrate infauna and epifauna</u>

- Are invertebrate infauna and epifauna colonizing the breakwater structures?
- What is the secondary productivity of invertebrate infauna and epifauna associated with the breakwater structures?

Parameter #1: Infauna and epifauna species composition, density (individuals/m^2), and biomass (g wet weight/m^2)

[4] Additional surveys may be warranted if the project site is directly impacted by a major storm.

a) Method: Deploy substrate trays at random locations along the breakwater structure (Eggleston et al., 1998; Gregalis et al., 2009; Baggett et al., 2013). Trays should remain in place for at least one month before collection (Baggett et al., 2013). Following collection, identify, count, and weigh (wet weight) all species within the baskets/trays. Report density, biomass, and secondary productivity on a square meter basis.
b) Timing and Frequency: Post-construction (Years 3 and 5)
c) Sample Size: TBD with final engineering and design
d) Performance Criteria:[5] Over five (5) years, the average infauna and epifauna invertebrate biomass is at least 84 g wet weight/ m^2
e) Corrective action [as budget allow]: Add structural material to existing breakwater structure

GOAL 1, Objective #3: Reduce shoreline erosion

- Is shoreline erosion rate being reduced?

Parameter #1: Shoreline profile/elevation

a) Method [list of potential options]:
    1. Method #1: Shoreline vectors would be derived from the acquired topographic (topobathy) data [Lidar – as budget allows] and would be referenced to vertical and horizontal datums so that accurate vertical measurements can be made using spatial software. Shoreline elevation profiles would be created using 3D components of the software.
    2. Method #2. Conduct bathymetric/topographic survey using RTK GPS with cross-sections extending from the reef structures to low elevation marsh habitat. Import and analyze data using spatial analysis software. Potential method described by Baggett et al. (2013).
b) Timing and Frequency: Pre-construction (once); Post-construction (Year 5); or if project site impacted by a major storm.
c) Sample Size: TBD with final engineering and design
d) Performance Criterion: Over five (5) years there is reduction or no change in shoreline slope compared to pre-construction condition.
e) Corrective Action [as budget allows]: Add structural material to breakwater structures.

[5] Performance criteria based on data from scientific literature. Beck, S. and M.K. La Peyre. 2014. Effects of oyster harvest activities on Louisiana reef habitat and resident nekton communities. Fishery Bulletin 113(3): 327-340. Raw biomass data was received from contact author and utilized to set this performance criterion.

Parameter #2: Marsh edge position

a) Method [list of potential options]: Several options for assessing marsh edge position are proposed. Any or all of these methods could be used to determine whether the parameter is met depending on available budget. In addition, other methodologies, not included here, could be identified as project design is finalized.
    1. Method #1: Shoreline vectors would be derived from the acquired topographic (topobathy) data [Lidar – as budget allows] and would be referenced to vertical and horizontal datums so that accurate vertical measurements can be made using spatial software. Shoreline data between years will be analyzed by calculating linear distance between derived position data.
    2. Method #2: Walk the marsh edge and take continuous readings with a differential GPS. Marsh edge is defined as the lower/seaward extent of the emergent marsh vegetation. Import and analyze data using spatial analysis software. Determine shoreline loss/gain in meters per year. Potential method describe by Steyer et al. (1995 revised 2000) and Baggett et al. (2013).
    3. Method #3: Establish permanent base locations along the length of the shoreline at least 10 m landward of the marsh edge. Measure the linear distance from the base location to the marsh edge along an established compass direction. Marsh edge is defined as the lower/seaward extent of the emergent marsh vegetation. Import and analyze data using spatial analysis software. Determine shoreline loss/gain in meters per year. Potential method describe by Steyer et al. (1995 revised 2000), Meyer et al. (1997), Piazza et al. (2005), and Baggett et al. (2013).
b) Timing and Frequency: Pre-construction (once); Post-construction (Year 5); or if project site impacted by a major storm.
c) Sample Size: TBD with final engineering and design
d) Performance Criterion: Over five (5) years, the average shoreline erosion loss is less than the average historic feet lost per year at the specific site.
e) Corrective Action [as budget allows]: Add structural material to breakwater structures.

<u>GOAL 2, Objective #4: Create or restore subtidal and intertidal reefs that are sustained for the expected lifespan of the project</u>

- Did the project achieve its design criteria?

- Is the projected structure of the reef being maintained?

Parameter #1: Structural integrity observations of reef structure

a) Method: Conduct visual observations during low tides or through manually poling site for substrate
b) Timing and Frequency: Post-construction (Opportunely, Years 0-5)[6].
c) Sample Size: Qualitative observations along entire length of reef structure.

Parameter #2-3: Reef height/elevation and area

a) Method: Conduct bathymetric survey using side-scan sonar, depth finder fitted with a differential GPS (e.g., Ceeducer), or another acoustic technique, of the reef area with transects over the entire project footprint. Import and analyze data using spatial analysis software. Reef area is the actual area (summed) of patches of living and non-living oyster shell (or reef substrate with and without live oysters) within the project footprint (Baggett et al., 2013).
b) Timing and Frequency: Post-construction (Years 0 and 5).
c) Sample Size: TBD with final engineering and design
d) Performance Criteria[7]:
    a. Performance Criterion: Over five (5) years the total subtidal reef area is equal to or greater than 267 acres and the elevation meets engineering design specifications.
    b. Performance Criterion: Over five (5) years the total intertidal reef habitat is equal to or greater than five (5) acres.
e) Corrective Action [as budget allows]: 1) Add structural material to existing reef structure or 2) construct new reef structures.

<u>GOAL 2, Objective #5: Support habitat utilization of subtidal reefs and intertidal reefs by invertebrate infauna and epifauna</u>

- Are invertebrate infauna and epifauna colonizing the reef structures?
- What is the secondary productivity of invertebrate infauna and epifauna associated with the subtidal and intertidal reefs?

[6] Additional surveys may be warranted if the project site is directly impacted by a major storm.

[7] These performance criteria are based on engineering and design specifications

Parameter #1: Infauna and epifauna species composition, density (individuals/m^2), and biomass (g wet weight/m^2)

a) Method: Deploy substrate trays along the reef structure (Eggleston et al., 1998; Gregalis et al., 2009; Baggett et al., 2013). Trays should remain in place for at least one month before collection (Baggett et al., 2013). Following collection, identify, count, and weigh (wet weight) all species within the baskets/trays. Report density and biomass on a square meter basis.
b) Timing and Frequency: Post-construction (Years 3 and 5).
c) Sample Size: TBD with final engineering and design
d) Performance Criterion[8]: Over five (5) years, the average infauna and epifauna invertebrate biomass is at least 84 g wet weight/m^2
e) Corrective Action [as budget allows]: 1) add structural material to existing reef structure, 2) construct new reef structures in a more suitable location(s)

Additional Monitoring

Water temperature, salinity, and dissolved oxygen

a) Method: Determine water temperature, salinity, and dissolved oxygen using appropriate instrumentation (e.g., YSI water quality sonde).
b) Timing and Frequency: During biological sampling events.
c) Sample Size: [TBD].

B.3.3 Monitoring Schedule

The tentative schedule for the project monitoring is shown in Table B- 5, separated by monitoring activity. Pre-construction monitoring will occur before project implementation. Construction monitoring occurs when project has been fully executed as planned (Year 0). Post construction monitoring will occur in the years following initial project construction (Years 1-5). This table represents the minimum number of monitoring events expected for this project. Depending on the implementation costs for monitoring, more monitoring events, higher sample size, and two more years of monitoring may be added to strengthen project tracking over time.

[8] Performance criteria based on data from scientific literature. Beck, S. and M.K. La Peyre. 2014. Effects of oyster harvest activities on Louisiana reef habitat and resident nekton communities. Fishery Bulletin 113(3): 327-340. Raw biomass data was received from contact author and utilized to set this performance criterion.

Table B- 5. Monitoring Schedule

Performance Criteria	Pre-Construction Monitoring	Construction monitoring (initial)	Post-Construction Monitoring (ongoing)				
		As-built (Year 0)	Year 1	Year 2	Year 3	Year 4	Year 5
BREAKWATER							
Structural integrity observations		X	X	X	X	X	X
Breakwater height/elevation and area		X					X
Biological monitoring					X		X
Marsh edge position and shoreline profile/elevation	X						X
Water quality monitoring					X		X
SUBTIDAL AND INTERTIDAL REEFS							
Structural integrity observations		X	X	X	X	X	X
Reef height/elevation and area		X					X
Biological monitoring					X		X
Water quality monitoring					X		X

B.3.4 Reporting and Data Requirements

B.3.4.1 Reporting

Annual reports will summarize the annual monitoring events and document the degree to which the project is attaining success. For the purposes of the annual reporting, a reporting year will cover from January 1st to December 31st. The first annual report will cover the calendar year immediately following the calendar year in which the implementing Trustee has completed construction of the Early Restoration Project. The reports should provide a summary of the previous annual report (including timelines documenting monitoring procedures), a list or table of performance standards that compares annual monitoring results to each performance criteria, and a summary of any problems encountered and solutions to each or whether corrective actions were necessary.

B.3.4.2 Quality Assurance / Quality Control Procedures

The Trustees have developed QA/QC guidance for the Early Restoration Projects which dictates the minimum requirements QA/QC clearance and release. This is described in the Trustees' approved document, "**Data QA/QC, Clearance, and Release Steps".**

The Goals of the document are to:

- Ensure the quality, utility, and integrity of information disseminated by trustees
- Develop procedures that are efficient, easy to use, and result in easily accessible data

Given the large amount of monitoring data that will be generated over the next few years, following agreed upon data QA/QC, clearance, and release procedures will help the Trustees:

- Ensure the quality, utility, and integrity of monitoring data
- Organize, track, locate, and access monitoring data over the long-term
- Share validated monitoring data with the public in a consistent and comprehendible format
- Meet stipulation requirements and respond to data requests by BP in a uniform and efficient manner

Furthermore, all Early Restoration Projects in Mississippi are subject to the formal Quality Management Program developed by Mississippi Department of Environmental Quality (MDEQ 2014). This program dictates that all data collection and monitoring efforts be performed under a project specific Quality Assurance Project Plan (QAPP). To meet this requirement, Mississippi DEQ has developed a Comprehensive Quality Assurance Plan (CompQAP) for all of its early restoration Projects (MDEQ 2015). Quality Assurance procedures for this monitoring plan, all field methods and associated data collection, recording and storage efforts are included in the CompQAP.

B.3.5 References

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B.4 Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore

B.4.1 Introduction

B.4.1.1 Project Overview

This project involves implementing roadway improvements to the 2.17-mile length of Park Road in the Davis Bayou unit of Gulf Islands National Seashore (GUIS). The project will enhance the use of Park Road by bicyclists and pedestrians.

B.4.1.2 Restoration Objectives and Performance Criteria

The overall goal of this restoration project is to restore a portion of the lost recreation-use injuries sustained on lands managed by DOI in the five Gulf States. The specific restoration objectives relevant for this monitoring plan are: (1) to construct and complete the project as scoped; and (2) to have bicyclists and pedestrians regularly using the improvements to Park Road.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). The specific performance criteria for this project are identified below.

- Performance Criterion #1: project is constructed and completed as designed and specified in the contract
- Performance Criterion #2: bicyclists and pedestrians are regularly using the improved areas along Park Road after project completion

B.4.1.3 Conceptual Model and Monitoring Questions

Table B-6, below, outlines the conceptual model for this restoration project that forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

Table B-6. Conceptual Model for Restoration

Activity	Output	Short-term outcome	Long-term outcome
• Construct/ implement enhancements to Park Road for bicyclists and pedestrians	Enhancements are complete and public are using Park Road to bike and hike	• New infrastructure and/or traffic controls • Function as designed	• Bicyclists and pedestrians are using the improved areas along Park Road after project completion

This monitoring plan has been designed around the objectives and desired outcomes for this restoration project, and is intended to address the following monitoring questions for each objective:

Objective #1: construct and complete the project as scoped

- Was the project constructed and completed as designed and contracted?

Objective #2: bicyclists and pedestrians are regularly using the improvements to Park Road

- Are bicyclists and pedestrians regularly using the improvements along Park Road to bike and walk?

B.4.1.4 Roles and Responsibilities

NPS employees (from park, region, Washington Office, or some combination thereof) acting as the Contracting Officer (CO) and Contracting Officer's Representative (COR) will be responsible for ensuring that the project is constructed and completed as scoped and contracted and that all deliverables are acceptable and have been received.

GUIS employees would document the regular use of the Park Road improved areas by bicyclists and pedestrians.

B.4.2 Project Monitoring

The monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified (if applicable), including example corrective actions that could be taken if the performance criteria are not met. The parameters listed below may or may not be tied to performance criteria and/or corrective actions.

Objective #1: construct and complete the project as scoped

- Was the project constructed and completed as designed and contracted?

  Parameter #1: level of completion of project

  a) Method: CO/COR review contractor reports, conduct on-site inspections, and compare to as-built designs
  b) Timing and Frequency: approximately monthly and at end of project, unless otherwise provided by contract
  c) Sample Size: approximately 10 sampling periods (approx. once per month for approx. 10 months), unless otherwise provided by contract
  d) Sites: restoration project site
  e) Performance Criterion: project is constructed and completed as designed and specified in the contract
  f) Corrective Action: resolution with contractor such that the terms of the contract are met

Objective #2: bicyclists and pedestrians are regularly using the improvements to Park Road

- Are bicyclists and pedestrians regularly using the improved areas along Park Road?

  Parameter #1: regular presence of bicyclists and pedestrians in the improved areas

  a) Method: visual observation of bicyclists and pedestrian in the improved areas by park staff
  b) Timing and Frequency: twice monthly on same days each month for one year after project completion
  c) Sample Size: 24 observation periods
  d) Sites: along Park Road (near same locations as pre-construction)
  e) Performance Criterion: bicyclists and pedestrians are regularly using the improved areas along Park Road after project completion
  f) Corrective action: none

B.4.3 Monitoring Schedule

The schedule for the project monitoring is shown in Table B- 7, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned (Year 0). Performance monitoring will occur in the year following initial project execution (Year 1).

Table B- 7. Monitoring Schedule

Monitoring Parameters	Monitoring Timeframe						
	Pre-Execution Monitoring	Execution Monitoring (initial)	Post-Execution Monitoring (ongoing)				
		As-built (Year 0)	Year 1				
Level of completion of project		X					
Observations of regular presence of bicyclists and pedestrians in improved areas	X		X				

B.4.4 Reporting and Data Requirements

Reporting will occur once at the end of Year 0 and once at the end of Year 1. There are no known data requirements. Reports will be in the form of brief narratives.

B.5 Bon Secour National Wildlife Refuge Trail Enhancement Project, Alabama

B.5.1 Introduction

B.5.1.1 Project Overview

This proposed project involves repairing and improving an existing trail (Jeff Friend Trail) located on the Bon Secour National Wildlife Refuge (NWR). This aged boardwalk and gravel trail would be repaired and improved to ensure safe public access and to improve the quality of visitor experience. An observation platform would also be constructed along the trail, and two handicapped parking spaces would be widened to better accommodate visitors. Improvements will meet the standards provided by the Americans with Disabilities Act. The project is expected to extend the availability of a safe and enhanced experience for visitors to the refuge.

B.5.1.2 Restoration Objectives and Performance Criteria

The overall goal of this restoration project is to restore a portion of the lost recreational use injuries sustained on lands managed by DOI in the five Gulf States. The specific restoration objectives relevant for this monitoring plan are: (1) to construct and complete the project as scoped; and (2) to provide all visitors access to the Jeff Friend Trail an enhanced visitor experience.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). The specific performance criteria for this project are identified below.

- Performance Criterion #1: project is constructed and completed as designed and specified in the contract for construction of improvements;
- Performance Criterion #2: public with all different abilities are able to use the enhanced trail after project completion;

B.5.1.3 Conceptual Model and Monitoring Questions

Table B- 8 below, outlines the conceptual model for this restoration, which forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

Table B- 8. Conceptual Model for Restoration

Activity	Output	Short-term outcome	Long-term outcome
• Construct and implement improvements and enhancements to Jeff Friend Trail for the public's use	• Improvements and enhancements are complete and the trail is used	• New infrastructures function as designed	• The public, including those with different abilities, are able to use the enhanced trail after project completion • New infrastructure is maintained for lifespan of project

This monitoring plan has been designed around the objectives and desired outcomes for this restoration project, and is intended to address the following monitoring questions for each objective:

Objective #1: construct and complete the project as scoped

- Was the project constructed and completed as designed and contracted?

Objective #2: improve access and use by the public for the Jeff Friend Trail at Bon Secour National Wildlife Refuge

- Are the public using the improved and enhanced trail?

B.5.1.4 Roles and Responsibilities

FWS employees (could be from Bon Secour NWR, the Fairhope DWH Field Office, the FWS Region 4 Office, or some combination thereof) acting as the Contracting Officer (CO) and Contracting Officer's Representative (COR) will be responsible for ensuring that the project is constructed and completed as designed .

FWS employees would document the use of the trail and parking area enhancements by the public.

B.5.2 Project Monitoring

The monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified (if applicable), including example corrective actions that could be taken if the performance criteria are not met. The parameters listed below may or may not be tied to performance criteria and/or corrective actions.

Objective #1: Construct and complete the project as designed

- Was the project constructed and completed as designed and contracted?
  Parameter #1: Level of construction to terms of contract
  g) Method: CO/COR review contractor reports, conduct on-site inspections, and compare to construction drawings
  h) Timing and Frequency: approximately monthly and at end of project, unless otherwise provided by contract
  i) Sample Size: approximately 10 (approx. once per month for approx. 10 months), unless otherwise provided by contract
  j) Sites: project site
  k) Performance Criteria: project is constructed and completed as designed and specified in the contract
  l) Corrective Action: resolution with contractor such that the terms of the contract are met

Objective #2: Improve access and enhance public use of the Jeff Friend Trail at Bon Secour National Wildlife Refuge

- Are the public of different abilities using the enhanced trail?

Parameter #1: Level of public use

a) Method: visual observation or automated counter
b) Timing and Frequency: Prior to construction of the enhancements to the Jeff Friend Trail visual observations or automated counters will be conducted twice monthly at randomly selected intervals until the project is initiated. Post construction, visual observations or automated counters will be conducted 3 hours per quarter for one year.
c) Sample Size: dependent upon project initiation. Pre-construction sampling expected to be about 10-20 observations.
d) Sites: Jeff Friend Trail and the parking area
e) Performance Criteria: the public are using the enhanced trail after project completion

Additional Monitoring: The use and performance of the project will continue to be measured throughout the life of the trail, however less frequently and methodically than the first year of NRDA Early Restoration monitoring. The continued monitoring will occur in the course of regular Refuge management activities and all costs associated with monitoring, maintenance, and/or corrective actions after construction is accepted, will be the responsibility of Bon Secour NWR and are, therefore, outside the scope of this monitoring plan.

B.5.3 Monitoring Schedule

The schedule for the project monitoring is shown in Table B- 9, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned (Year 0). Performance monitoring will occur in the year following initial project execution.

Table B- 9. Monitoring Schedule

Monitoring Parameters	Monitoring Timeframe		
	Pre-Execution Monitoring	Execution Monitoring (initial)	Post-Execution Monitoring
		As-built (Year 0)	Year 1
Review contractor invoices and deliverables, including the completed project	X	X	

Observations or counts of visitors(TBD)	X		X

B.5.4 Reporting and Data Requirements

Reporting will occur once at Year 0 and once at Year 1. There are no known data requirements. Reports will be in the form of brief narratives.

B.6 Osprey Restoration in Coastal Alabama

B.6.1 Introduction

This document presents a monitoring plan designed to monitor and evaluate the performance of the Osprey Restoration in Coastal Alabama project. This project seeks to compensate the losses to natural resources resulting from the Spill by establishing 5 osprey nesting platforms in Mobile and Baldwin Counties in coastal Alabama.

B.6.1.1 Project Overview

The proposed restoration project would improve Osprey nesting success by establishing five (5) Osprey nesting platforms in multiple locations in coastal Alabama in Mobile and Baldwin Counties, including Gulf State Park. The specific locations and design of these nesting platforms would be developed to maximize project success and meet regulatory requirements. Five general areas have been identified for the location of these platforms (from west to east): the vicinity of Portersville Bay, the vicinity of Dauphin Island, the vicinity of Fort Morgan, the vicinity of the Little Lagoon area in Gulf Shores, and in Gulf State Park (Figures B 13- B17).

Figure B- 10 and Figure B- 11 illustrate typical osprey nesting platforms. A typical design for such structures is an approximately 1 meter by 1 meter nesting platform atop a pole approximately 3 to 6 meters high. Poles are typically placed 1 to 2 meters deep in the ground. Sheet metal can be attached to the pole approximately 1 to 2 meters above the ground to protect eggs and fledglings from predators.

Figure B- 10. Potential Osprey Restoration Locations in the Vicinity of Portersville Bay



Figure B- 11. Potential Osprey Restoration Locations in the Vicinity of Dauphin Island



Figure B- 12. Potential Osprey Restoration Locations in the Vicinity of Fort Morgan



Figure B- 13. Potential Osprey Restoration Locations in the Vicinity of Little Lagoon, Gulf Shores



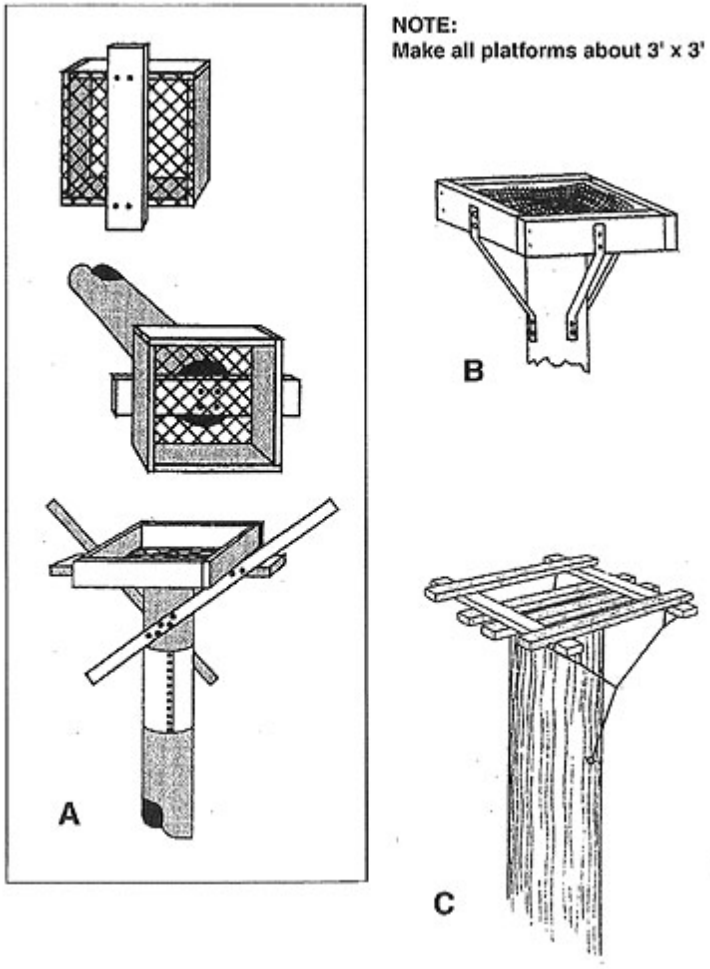
Figure B- 14. Potential Osprey Restoration Locations in Gulf State Park



Figure B- 15. View of Typical Osprey Nesting Platform



Figure B- 16. Dimensions of Typical Osprey Nesting Platform



B.6.1.2 Restoration Objectives and Performance Criteria

The overall goal of this restoration project is to provide additional osprey habitat for osprey restoration in coastal Alabama. The specific restoration objective relevant for this monitoring plan is to (1) construct osprey nesting platforms that meet project design criteria and (2) increase osprey nesting success in the project area.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). Since full recovery of restoration projects may occur over a long time frame, performance criteria typically represent interim milestones that will help project managers determine if the project is improving along an acceptable trajectory. The specific performance criteria for this project are identified below and shown in Table B- 10.

We will monitor the platforms for utilization as described in the sections of this document that follow.

B.6.1.3 Conceptual Model and Monitoring Questions

Table B- 10, below, outlines the conceptual model that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

Table B- 10. Conceptual model for the Osprey Restoration in Coastal Alabama Project

Activity	Output	Outcomes
• Construction of Osprey Nesting Platforms	• Platform use by breeding pairs.	• Fledglings

This monitoring plan has been designed around the project's objectives and desired outcomes, and is intended to address the following monitoring questions for each objective:

Objective 1: construction of osprey nesting platforms that meet project design criteria.

- Were the nesting platforms constructed as designed?

Objective #2: increase osprey nesting success in project area.

- Are the platforms being utilized by osprey?
- Are fledglings present in nests?

B.6.2 Project Monitoring

The monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, and sites. In

addition, performance criteria for each parameter are identified (if applicable), including corrective actions that may be taken if the performance criteria are not met.

Objective#1: Construction of osprey nesting platforms meet project design criteria

- Were the nesting platforms constructed as designed?
  Parameter #1: Inspection of nesting platforms prior to, during and after construction.
  a) [Potential] Method:
     1. Meet with contractor to insure design specifications are understood.
     2. On-site inspection of construction of all platforms to insure proper placement.
     3. Post-construction inspection of platforms.
  b) Timing and Frequency:
     1. Pre-construction (once)
     2. During Construction (once)
     3. Post-construction (1-3 times a year for Years 1-5)
  c) Sites: All platform sites (5)
  d) Performance Criterion: Successful construction of 5 Osprey nesting platforms.

Objective #2: Increase Osprey Nesting Success in the Project Area.

- Are the platforms being utilized by osprey?
- Are fledglings present in nests?

Parameter #1: Utilization by a breeding pair.

a) Method: Observe platform and document presence of nesting materials and/or presence of osprey
b) Timing and Frequency: Post-construction (1-3 times a year, including nesting season, for Years 1-5)
c) Sites: All platform sites
d) Performance Criterion: Presence of nesting osprey

Parameter #2: Presence of fledglings

e) Method: Observe platform and document presence of fledglings
f) Timing and Frequency: Post-construction (1-3 times a year, including nesting season, for Years 1-5)
g) Sites: All platform sites
h) Performance criterion: presence of osprey fledglings.

B.6.3 Monitoring Schedule

The schedule for the project monitoring is shown in Table B- 11, separated by monitoring activity. Pre-construction monitoring will occur before project implementation. Implementation monitoring will occur immediately following project implementation (Year 0). Performance monitoring will occur in the years following project implementation (Years 1-5).

Table B- 11. Monitoring schedule for the Osprey Restoration in Coastal Alabama Project

	Pre-construction	As-built	Year 1	Year 2	Year 3	Year 4	Year 5
Inspection of nesting platforms	X	X					
Presence of Breeding Pairs			X	X	X	X	X
Presence of Fledglings			X	X	X	X	X

B.6.4 Reporting and Data Requirements

B.6.4.1 Reporting

Annual reports will summarize the annual monitoring events and document the degree to which the project is attaining success. For the purposes of the annual reporting, a reporting year will cover from January 1st to December 31st. The first annual report will cover the calendar year immediately following the calendar year in which the implementing Trustee has completed construction of the Early Restoration Project. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. The reports should provide a summary of the previous annual report (including timelines documenting monitoring procedures), a list or table of performance standards in that compares annual monitoring results to each performance criteria, and a summary of any problems encountered and solutions to each or whether corrective actions were necessary.

B.6.4.2 Quality Assurance / Quality Control Procedures

Monitoring data sheets will be reviewed by ADCNR staff and/or its contractor for accuracy of dates, times and observational information recorded. Discrepancies and/or questions concerning data or observations will be reviewed and rectified in consultation with the ADCNR staff and/or contractor performing monitoring.

B.7 Point aux Pins Living Shorelines

B.7.1 Introduction

This document presents a monitoring plan designed to monitor and evaluate the performance of the Point aux Pines (PaP) Living Shorelines project in Mississippi Sound, Alabama. This monitoring plan is intended to be specific to this Early Restoration Project and should not be generalized beyond this project. Other monitoring plans and designs may be appropriate in other contexts or sites.

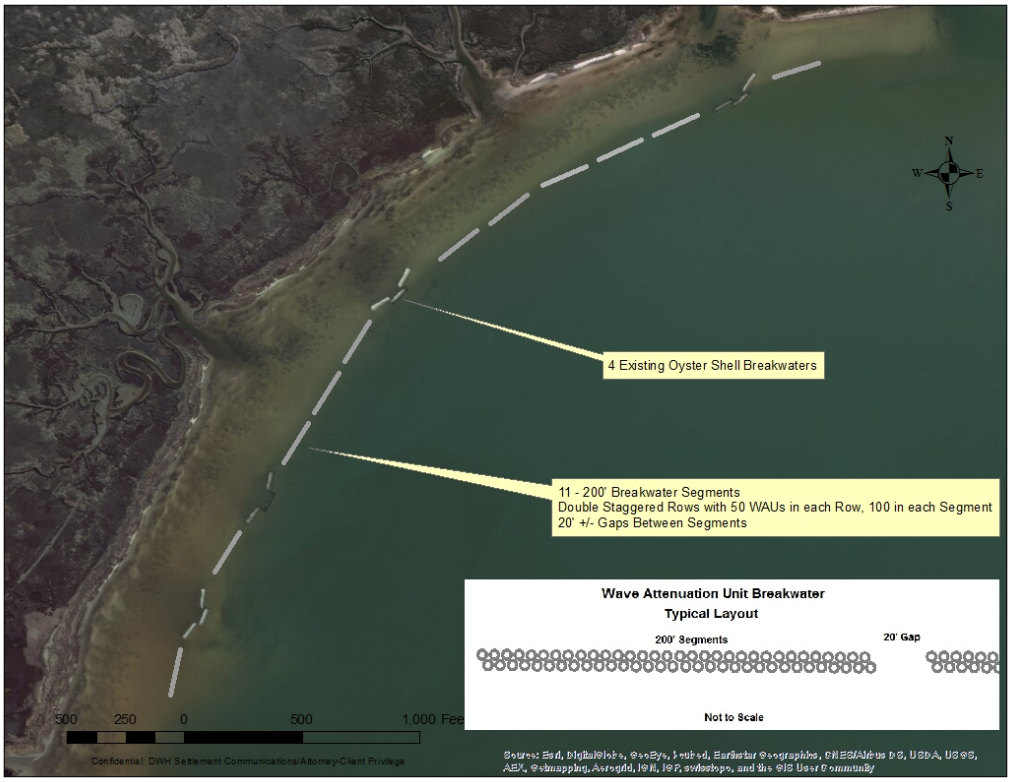
B.7.1.1 Project Overview

The proposed PaP early restoration project is located along the northeastern portion of Point aux Pins, along the northern shoreline Mississippi Sound in southern Mobile County, Alabama (see Figure B- 17). Shoreline erosion rates for the project area vary from approximately 3-12 feet between 1992 and 2010 (based upon aerial photography interpretation). The goal of the project is to reduce the rate of erosion through reduction of wave height and energy while enhancing the benthic ecosystem function of the area. The preliminary layout of the living shoreline is shown in Figure B- 18.

Figure B- 17. Site Location



Figure B- 18. Proposed Project Layout



B.7.1.2 Restoration Objectives and Performance Criteria

The overall goal of this restoration project is to reduce the rate of erosion through reduction of wave height and energy while enhancing the ecosystem function of the area. The specific restoration objectives relevant for this monitoring plan are: 1) construction of breakwaters that meet project design criteria and that are sustained for the expected lifespan of the project to support benthic secondary productivity and reduce shoreline erosion, 2) support habitat utilization of the breakwater segments by bivalves and other invertebrate infauna and epifauna to increase secondary benthic productivity at the project site, and 3) reduction of shoreline erosion rate to protect existing salt marsh habitat.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). Since full recovery of restoration projects may occur over a long time frame, performance criteria typically represent interim milestones that will help project managers determine if the project is improving along an acceptable trajectory. The specific performance criteria for this project are identified below and shown in Table B- 12.

1) Build living shorelines that are sustained for the expected lifespan of the project.
    a. Performance Criterion: At year 0, breakwater segments meet the design specifications.
    b. Performance Criterion: At years 1-5, breakwater segments are present.

2) Support habitat utilization of breakwater segments by bivalves and other invertebrate infauna and epifauna.
   a. Performance Criterion: At year 5, 90% of breakwater units have invertebrate infauna and epifauna present.
3) Reduce shoreline erosion.
   a. Performance Criterion: Over 5 years, the cumulative shoreline slope is unchanged and shoreline loss is less than pre-project average loss/year.

Table B- 12. Performance criteria for the Point aux Pins Living Shoreline Project. (Finalize After Design is Complete)

Performance criteria	Implementation	Post-Implementation				
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Breakwater Segment Construction	Meets design specifications	Present	Present	Present	Present	Present
Invertebrate infauna and epifauna density						90% of Breakwater Units have invertebrate infauna and epifauna present
Marsh Edge Position						Shoreline erosion loss is less than pre project average loss per year.

B.7.1.3 Conceptual Model and Monitoring Questions

Table B- 13, below, outlines the conceptual model that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

Table B- 13. Conceptual Model for the Point aux Pins Living Shorelines Project

Activity	Output	Short-term outcome	Long-term outcome
• Construct breakwater segments parallel to shoreline	• 2,400 linear feet of breakwater segments are built	• Wave energy is dissipated • Shoreline erosion is reduced • Invertebrate infauna and epifauna settle and grow on the breakwater segments	• Breakwater segments are sustained for the expected lifespan of the project • Wave energy is dissipated • Shoreline erosion rate is reduced • Breakwaters support a diverse benthic community

This monitoring plan has been designed around the project's objectives and desired outcomes, and is intended to address the following monitoring questions for each objective:

Objective #1: Construction of breakwater segments that meet project design criteria .

- Were the breakwater segments constructed in accordance with design criteria?
- Are the breakwater segments present during years 1-5?

Objective #2: Support habitat utilization of the breakwater segments invertebrate infauna and epifauna to increase secondary benthic productivity at the project site

- Are invertebrate infauna and epifauna colonizing the breakwater structures?
- What is the density of invertebrate infauna and epifauna associated with the breakwater structures?

Objective #3: Reduction of shoreline erosion to protect existing salt marsh habitat

- Is shoreline erosion rate being reduced?

B.7.2 Project Monitoring

The monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified (if applicable).

Objective #1: Construction of breakwater segments that meet project design criteria.

- Did the project achieve its design criteria?

Parameter #1: Breakwater Segments Constructed in Accordance with Design Criteria

e) Method: Conduct visual inspections and take pictures of the project site from the boat or shoreline.
f) Timing and Frequency: During Construction and Immediately Post-construction (Years 0) then annually for years 1-5. (Annually from Years 1-5 for observational purposes only. Additional visual inspections are recommended to be conducted after major storm events).
g) Sample Size: Observations of all breakwater segments, counts of WAU's placed.
h) Performance Criterion: Breakwater segments meet project design criteria.

Objective #2: Support habitat utilization of the breakwater structures by invertebrate infauna and epifauna to increase secondary benthic productivity at the project site

- Are invertebrate infauna and epifauna colonizing the breakwater structures?
- What is the density of invertebrate infauna and epifauna on the breakwater structures?

Parameter #1 : Invertebrate infaunal and epifaunal species composition, and abundance).

a) Method: Identify and count invertebrate infaunal and epifaunal organisms within a defined area on WAUs. Utilize methods that report density on a square meter basis (e.g., quadrat sampling). Infaunal and epifaunal species composition and density (individuals m^{-2}) will be measured annually.
b) Timing and Frequency: Post-construction Year 1-5 (1 times per year- late summer).
c) Sample Size: 0.25 m^2 quadrats on five (5) randomly selected breakwater units within each breakwater segment for a total of 55 - 0.25m^2 quadrats sampled.
d) Performance Criterion: At year 5, 90% of breakwater units have invertebrate infauna and epifauna present.

Objective #3: Reduction of shoreline erosion rate to protect existing salt marsh habitat

- Is shoreline erosion being reduced?
  Parameter #1: Shoreline elevation/profile
  a) Method: Conduct bathymetric/topographic survey of cross-shore profiles using RTK GPS with cross-sections at the center of each breakwater segment. Cross sections should begin 100 feet seaward and extend to fixed marked location 100' landward of the marsh edge at Year 0. This landward fixed point shall be marked with a PVC pipe. Note the location and elevation of the marsh edge.
  b) Timing and Frequency: Pre-construction (once) and Post-construction (Years 0- 5, 1 time per year during late summer. Other surveys may be conducted following major storm events.)
  c) Sample Size: 11 transects, 1 each at the center of each breakwater segment.
     a. Performance Criterion: Over years 1-5, the average shoreline erosion loss is less than the calculated average loss per year at project site.

B.7.3 Monitoring Schedule

The schedule for the project monitoring is shown in Table B- 14, separated by monitoring activity.

Table B- 14. Monitoring schedule for the Point aux Pins Living Shorelines Project

	Implementation Monitoring	Performance Monitoring				
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Breakwater Segment Construction	X	present	present	present	present	present
Bathymetric / topographic survey/Marsh Edge	X	X	X	X	X	X
Biological monitoring		X	X	X	X	X

B.7.4 Reporting and Data Requirements

B.7.4.1 Reporting

Annual reports will summarize the annual monitoring events and document the degree to which the project is attaining success. For the purposes of the annual reporting, a reporting year will cover from January 1st to December 31st. The first annual report will cover the calendar year immediately following the calendar year in which the implementing Trustee has completed construction of the Early Restoration Project. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. The reports should provide a summary of the previous annual report (including timelines documenting monitoring procedures), a list or table of performance standards in that compares annual monitoring results to each performance criteria, and a summary of any problems encountered and solutions to each or whether corrective actions were necessary.

B.7.4.2 Quality Assurance / Quality Control Procedures

Monitoring data sheets will be reviewed by ADCNR staff and/or its contractor for accuracy of dates, times and observational information recorded. Discrepancies and/or questions concerning data or observations will be reviewed and rectified in consultation with the ADCNR staff and/or contractor performing monitoring.

B.7.5 References

Baggett, L.P., S.P. Powers, R. Brumbaugh, L.D. Coen, B. DeAngelis, J. Green, B. Hancock, and S. Morlock. 2013. Oyster Habitat Restoration Monitoring and Assessment Manual. The Nature Conservancy, Arlington, VA. March. http://www.oyster-restoration.org/

Eggleston, D.B., L.L. Etherington, and W.E. Elis. (1998). Organism response to habitat patchiness: species and habitat-dependent recruitment of decapods crustaceans. Journal of Experimental Marine Biology and Ecology. 223: 111-132

Gregalis, K.C., M.W. Johnson, and S.P. Powers. (2009). Restored oyster reef location and design affect responses of resident and transient fish, crab and shellfish species in Mobile Bay, Alabama. Transactions of the American Fisheries Society. 138: 314-327

Steyer, G.D., R.C. Raynie, D.L. Steller, D. Fuller and E. Swenson 1995. Quality management plan for Coastal Wetlands Planning, Protection, and Restoration Act monitoring program. Open-file series no. 95-01 (Revised June 2000). Baton Rouge: Louisiana Department of Natural Resources, Coastal Restoration Division. 97 pp.

B.8 Shell Belt and Coden Belt Roads Living Shoreline

B.8.1 Introduction

This document presents a monitoring plan designed to monitor and evaluate the performance of the Shell Belt and Coden Belt Roads Living Shorelines project (Project) in south Mobile County, Alabama.. This monitoring plan is intended to be specific to this Early Restoration Project and should not be generalized beyond this project. Other monitoring plans and designs may be appropriate in other contexts or sites.

B.8.1.1 Project Overview

The proposed Project is located along the northern shoreline of Portersville Bay in the eastern portion of Mississippi Sound in southern Mobile County, Alabama (see Figure B- 19). The site is a located along two bulkheaded roads, Shell Belt Road and Coden Belt Road. The primary goal of the project is to enhance the benthic ecosystem function of the area. The secondary goal is to promote the restoration of salt marsh between the living shoreline breakwater and the existing bulkhead. The preliminary layout of the living shoreline is shown in Figure B- 20 and Figure B- 21.

Figure B- 19. Project Location



Figure B- 20. Shell Belt Road Site Location & Proposed Project Layout

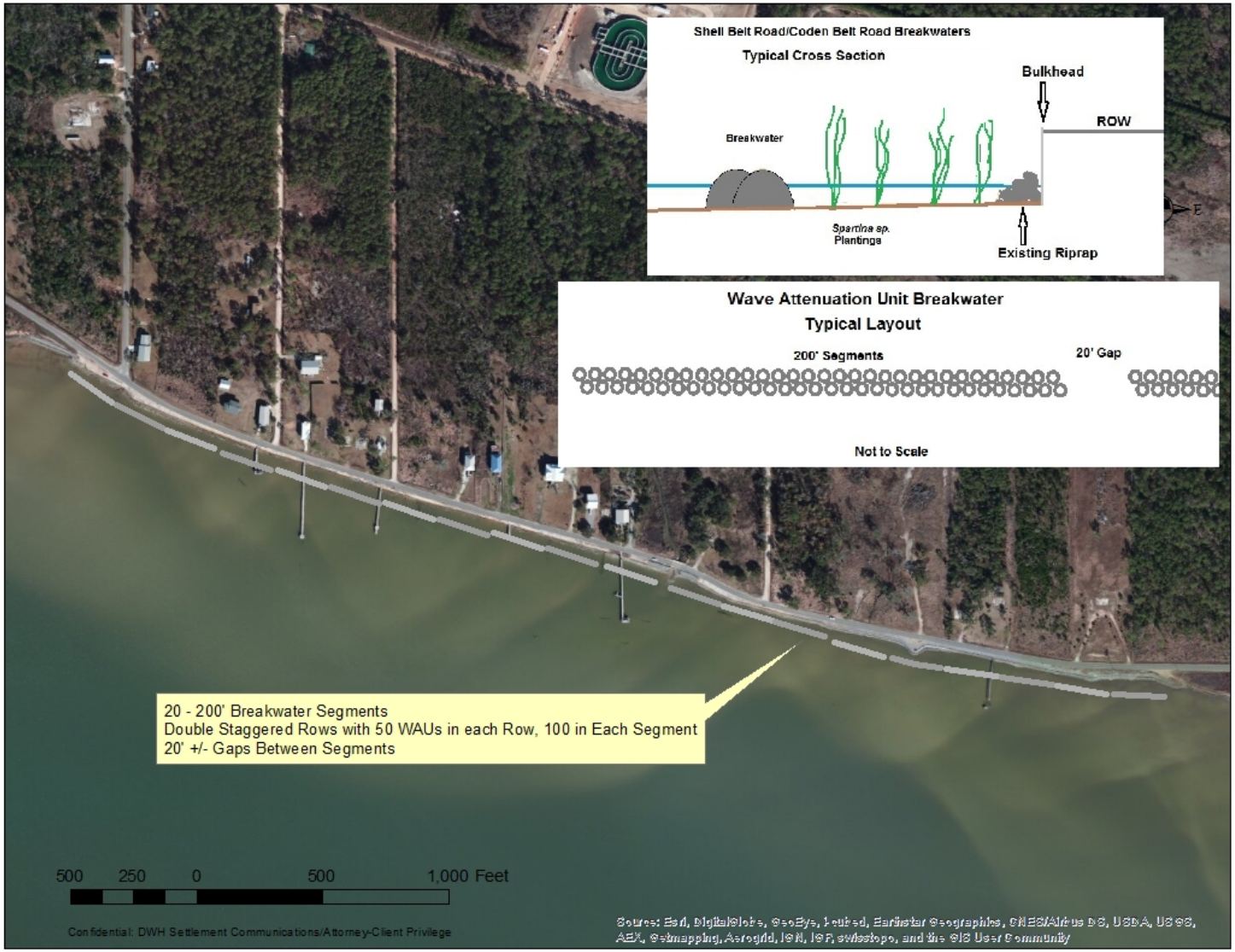
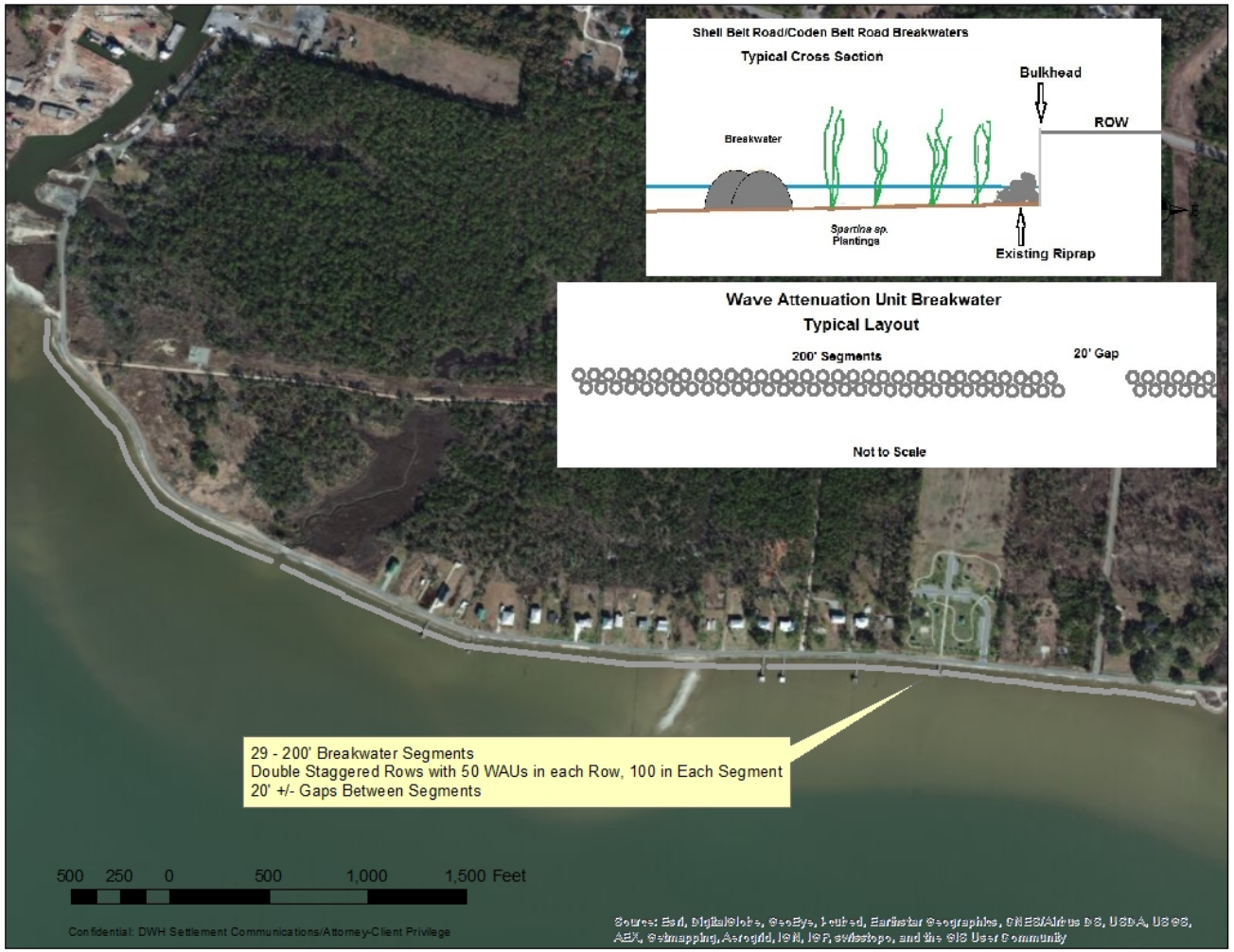


Figure B- 21. Coden Belt Road Site Location & Proposed Project Layout



B.8.1.2 Restoration Objectives and Performance Criteria

The primary goal of the project is to enhance the benthic ecosystem function of the area. The secondary goal is to reduce wave height and energy to promote the restoration of salt marsh between the living shoreline breakwater and the existing bulkhead. The specific restoration objectives relevant for this monitoring plan are: 1) construction of living shorelines breakwater segments that meet project design criteria and that are sustained for the expected lifespan of the project to support benthic secondary productivity and reduce wave energies, 2) support habitat utilization of the reefs by bivalves and other invertebrate infauna and epifauna to increase secondary benthic productivity at the project site, and 3) restoration of salt marsh habitat through the planting of *Spartina alterniflora* or similar native marsh vegetation.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). Since full recovery of restoration projects may occur over a long time frame, performance criteria typically represent interim milestones that will help project managers determine if the project is improving along an acceptable trajectory. The specific performance criteria for this project are identified below and shown in Table B- 15.

4) Build living shorelines that are sustained for the expected lifespan of the project.
    a. Performance Criterion: At year 0, breakwater segments meet the design specifications. At years 1-5 breakwater segments are present.
5) Support habitat utilization of reefs by bivalves and other invertebrate infauna and epifauna.
    a. Performance Criteria: At year 5, 90% of breakwater units have infaunal and epifaunal organisms present.
6) Establish Marsh Vegetation.
    a. Performance Criteria: At Year 1, 75% of transplanted marsh plugs have survived.

Table B- 15. Performance criteria for the Shell Belt and Coden Belt Roads Living Shorelines Project

Performance criteria	Implementation	Post-Implementation				
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Breakwater Segment	Meets design specifications	present	present	present	present	Present
Invertebrate infaunal and epifaunal densities						Invertebrate infauna and epifauna present on 90% of Breakwater Units
Marsh Plantings Survival	Number of Required Plugs Planted	75% Survival of Plantings				

B.8.1.3 Conceptual Model and Monitoring Questions

Table B- 16, below, outlines the conceptual model that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

Table B- 16. Conceptual model for the Shell Belt and Coden Belt Roads Living Shorelines Project

Activity	Output	Short-term outcome	Long-term outcome
• Construct breakwater segments parallel to shoreline.	• 10,800 linear feet of breakwater segments are built.	• Invertebrate infauna and epifauna settle and grow • Salt marsh vegetation is planted.	• Breakwaters are sustained for the expected lifespan of the project. • Wave energy is dissipated. • Reefs support a diverse benthic community. • Salt Marsh is established between breakwater and existing bulkhead.

This monitoring plan has been designed around the project's objectives and desired outcomes, and is intended to address the following monitoring questions for each objective:

Objective #1: Construction of breakwater segments that meet project design criteria and that are sustained for the expected lifespan of the project.

- Did the project achieve its design criteria?

Objective #2: Support habitat utilization of the breakwater segments by invertebrate infauna and epifauna.

- Are invertebrate infauna and epifauna colonizing and being maintained on the breakwater structures?
- What is the density of invertebrate infauna and epifauna associated with the breakwater structures?

Objective #3: Restoration of salt marsh habitat through the planting of *Spartina alterniflora*.

- Are marsh plantings surviving?

B.8.2 Project Monitoring

The monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified (if applicable), including corrective actions that may be taken if the performance criteria are not met.

Objective #1: Construction of breakwaters that meet project design criteria and that are sustained for the expected lifespan of the project to support benthic secondary productivity.

- Did the project achieve its design criteria?

  Parameter #1: Structural integrity of breakwater structure

  i) Method: Conduct visual inspections and take pictures of the project site from the boat or shoreline.
  j) Timing and Frequency: Post-construction (Annually from Years 1-5 for observational purposes only. Additional visual inspections are recommended to be conducted after major storm events).
  k) Sample Size: Observations along entire length of breakwater structure
  l) Performance Criteria:
     a. Year 0: Did the contractor construction breakwater segments as specified?
     b. Years 1-5: Are the breakwater segments present?

Objective #2: Support habitat utilization of the breakwater segments invertebrate infauna and epifauna to increase secondary benthic productivity at the project site

- Are invertebrate infauna and epifauna colonizing and being maintained on the breakwater structures?
- What is the density of invertebrate infauna and epifauna on the breakwater structures?

Parameter #1 : Invertebrate infauna and epifauna species composition and abundance.

a) Method: Identify and count invertebrate infaunal and epifaunal organisms within a defined area on WAUs. Utilize methods that report density on a square meter basis (e.g., quadrat sampling).
b) Timing and Frequency: Post-construction Year 1-5 (1 times per year- late summer).
c) Sample Size: 0.25 m^2 quadrats on five (5) randomly selected breakwater units within each breakwater segment for a total of 55 - 0.25m^2 quadrats sampled.
   e) Performance Criterion: At year 5, 90% of breakwater units have infaunal and epifaunal organisms present.

Objective #3: Restoration of salt marsh habitat through the planting of *Spartina alterniflora*.

- Is the planted marsh surviving?

Parameter #1: Marsh Planting Survival

a. Method: Visual counts of presence or absence of live plantings behind each breakwater segment.
b. Timing and Frequency: Post-construction (Year 1). The timing of the post-implementation surveys may be adjusted based on the actual date of the completion of plantings. Typically end of growing season in late summer/early fall. Additional surveys may be conducted after major storms.
c. Sample Size: Presence/absence of all plantings
d. Performance Criterion: At year 1: 75% survival of marsh plantings.
e. Corrective Action: Contractual requirement to replace plugs to reach 75% survival.

Parameter #2: Marsh Vegetation Cover

a. Method: Conduct cover estimates in 1 meter square plots located randomly behind each breakwater (number of plots TBD).
b. Timing and Frequency: Post-construction (Years 1-5). The timing of the post-implementation surveys may be adjusted based on the actual date of the completion of plantings. Years 1-5, once per year. Additional surveys may be conducted after major storms.
c. Sample Size: 1 meter square plots (number of plots TBD).
d. Performance Criterion: None. This is a supporting monitoring parameter.

B.8.3 Monitoring Schedule

The schedule for the project monitoring is shown in Table B- 17, separated by monitoring activity. Baseline monitoring will occur before project implementation. Implementation monitoring will occur immediately following project implementation (Year 0). Performance monitoring will occur in the years following project implementation (Years 1 - 5).

Table B- 17. Monitoring schedule for the Shell Belt and Coden Belt Roads Living Shoreline Project

	Implementation Monitoring	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Breakwater Segment Construction Observations	X	X	x	x	x	x	x
Biological monitoring			X	X	X	X	X
Marsh Plantings Survival		X					
Marsh Cover			X	X	X	X	X

B.8.4 Reporting and Data Requirements

B.8.4.1 Reporting

Annual reports will summarize the annual monitoring events and document the degree to which the project is attaining success. For the purposes of the annual reporting, a reporting year will cover from January 1st to December 31st. The first annual report will cover the calendar year immediately following the calendar year in which the implementing Trustee has completed construction of the Early Restoration Project. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. The reports should provide a summary of the previous annual report (including timelines documenting monitoring procedures), a list or table of performance standards in that

compares annual monitoring results to each performance criteria, and a summary of any problems encountered and solutions to each or whether corrective actions were necessary.

B.8.4.2 Quality Assurance / Quality Control Procedures

Monitoring data sheets will be reviewed by ADCNR staff and/or its contractor for accuracy of dates, times and observational information recorded. Discrepancies and/or questions concerning data or observations will be reviewed and rectified in consultation with the ADCNR staff and/or contractor performing monitoring.

B.8.5 References

Baggett, L.P., S.P. Powers, R. Brumbaugh, L.D. Coen, B. DeAngelis, J. Green, B. Hancock, and S. Morlock. 2013. Oyster Habitat Restoration Monitoring and Assessment Manual. The Nature Conservancy, Arlington, VA. March. http://www.oyster-restoration.org/

Eggleston, D.B., L.L. Etherington, and W.E. Elis. (1998). Organism response to habitat patchiness: species and habitat-dependent recruitment of decapods crustaceans. Journal of Experimental Marine Biology and Ecology. 223: 111-132

Gregalis, K.C., M.W. Johnson, and S.P. Powers. (2009). Restored oyster reef location and design affect responses of resident and transient fish, crab and shellfish species in Mobile Bay, Alabama. Transactions of the American Fisheries Society. 138: 314-327

Steyer, G.D., R.C. Raynie, D.L. Steller, D. Fuller and E. Swenson 1995. Quality management plan for Coastal Wetlands Planning, Protection, and Restoration Act monitoring program. Open-file series no. 95-01 (Revised June 2000). Baton Rouge: Louisiana Department of Natural Resources, Coastal Restoration Division. 97 pp.

B.9 Seagrass Recovery Project at Gulf Islands National Seashore, Florida District

B.9.1 Introduction

The proposed Seagrass Recovery project at Gulf Islands National Seashore's Florida District (hereafter, GUIS) will address damage to shallow seagrass beds on DOI-managed lands in the five Gulf States by restoring injury to turtle grass (*Thalassia testudinum*) in seagrass beds located on the south side of the GUIS's Naval Live Oaks Preserve in Santa Rosa Sound, in Santa Rosa County.

Although a general area for seagrass restoration has been selected, specific sites will not be determined until the completion of a site assessment. The site assessment will determine the severity and current conditions of injuries to seagrass beds. The assessment will then evaluate which injuries may recover independently and which ones need intervention to promote re-growth of seagrass. Sites to be restored will be selected based on a restoration priority determined from the site assessment and available funding. This monitoring plan would be applied to the sites restored based on these priorities.

B.9.1.1 Project Overview

Restoration activities include transplanting seagrass and installing bird stakes and signage. Monitoring would be conducted to assess whether a site is recovering.

B.9.1.2 Restoration Objectives and Performance Criteria

The overall goal of this restoration project is to restore seagrass habitat on DOI-managed lands in the five Gulf States by restoring injured turtle grass (*Thalassia testudinum*) habitats located in GUIS. The specific restoration objectives relevant for this monitoring plan are: (1) Stabilize substrates and (2) Promote re-growth of turtle grass.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). The specific performance criteria for this project are identified below.

- Performance Criteria #1: At Year 1, transplants have survived in restored areas;
- Performance Criteria #2: At Year 0 and 1, bird stakes and/or signs are installed as designed and maintained.

B.9.1.3 Conceptual Model and Monitoring Questions

Table B- 18, below, outlines the conceptual model for this restoration type that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

Table B- 18. Conceptual Model for Restoration

Activity	Output	Short-term outcome	Long-term outcome
• Install bird stakes • Install signage • Transplant seagrass	• 0.02 acres of seagrass beds restored	• Bird stakes are utilized as intended • Signs are installed • Promoted new seagrass growth	• Area of damaged seagrass beds is restored • Halted further degradation

This monitoring plan is intended to address the following monitoring questions for each objective:

Objective #1: Stabilize, protect, and enhance seagrass beds through transplanting seagrass, installing bird stakes and signage.

- Was the project implemented as designed?
- Are seagrass planting units surviving?
- Are bird stakes and signage being maintained?

Objective #2: Promote re-growth of native seagrass beds

- Is the areal coverage of seagrass in damaged area increasing?

B.9.2 Project Monitoring

Once all site restoration has been completed and as-planted conditions are documented, the site will be monitored after one year. The overall goal for this project is to restore seagrass. Given this goal, restoration success for this project will be based on establishment of seagrass transplants in the restored area. Restoration success will be monitored and evaluated using two parameters: structural integrity of stakes and signs and areal coverage of seagrass. The methods are described below:

Objective #1: Stabilize, protect, and enhance seagrass beds through transplanting seagrass, installing bird stakes and signage.

- Was the project implemented as designed?
- Are seagrass planting units surviving?
- Are bird stakes and signage being maintained?

Parameter #1: **Structural Integrity**

a.) Method: Visual observation of bird stakes and signs to ensure they are still in place and performing as designed.

b.) Timing and Frequency: Bird stakes and signage will be inspected during the follow up monitoring event approximately one year after construction.
c.) Sample Size: monitor all stakes and signs.
d.) Performance Criteria: At Year 0 and 1, bird stakes and/or signs are installed as designed and maintained.
e.) Corrective Action: Repair or replace signs and stakes.

Objective #2: Promote re-growth of native seagrasses

- Is the transplanted seagrass surviving?

Parameter #1: **Percent Cover**:

a.) Method: At least ten percent of the restored area will be monitored through random placement of square 0.25m^2 quadrats. Benthic cover of seagrasses will be estimated in the quadrats using a modified Braun-Blanquet scale.
b.) Timing and Frequency: Initially after the transplants are installed and again one year later.
c.) Sample Size: At least ten percent of the restored area will be monitored through random placement of square 0.25m^2 quadrats.
d.) Performance Criteria: At Year 1, transplanted seagrass is surviving in restored areas.
e.) Corrective Action: If transplanted seagrass has not survived based on the monitoring conducted, contractor should replant if project funding is available.

B.9.3 Monitoring Schedule

Once all site restoration has been completed, the site will be monitored immediately after planting and again one year later, providing the restored area time to begin recovery.

B.9.4 Reporting and Data Requirements

A report will be prepared after completion of site restoration and a final report will be completed after the data are collected one year after site restoration.

B.10 Sea Turtle Early Restoration Project Component A: Kemp's Ridley Sea Turtle Nest Detection and Enhancement

B.10.1 Introduction

The Trustees developed this monitoring plan (Plan) as part of the Sea Turtle Early Restoration Project for the Kemp's Ridley Sea Turtle Nest Detection and Enhancement Project Component. This Project and its components are included as a Phase IV Deepwater Horizon early restoration project and are intended to at least partially compensate the public for injury to sea turtles. The purpose of this plan is to describe monitoring activities that will be conducted to evaluate and document restoration effectiveness, including performance criteria for determining the success of restoration or need for interim corrective action (15 CFR §990.55(b)(1)(vii)).

This Plan will be implemented by the Texas Trustees and the Department of the Interior and may be modified over time based on the management needs for the Project.

This Plan is intended to apply to the performance monitoring activities included herein. The Trustees and BP Exploration & Production, Inc. ("BPXP") agree that they will include this Plan in the final Project Stipulation for the Sea Turtle Early Restoration Project.

Project Overview

This project will help protect Kemp's ridley nests from predation and other environmental and anthropogenic disturbances. This project will provide support for additional staff, training, equipment, supplies and vehicles over a ten year period in Texas and Mexico. The project will also provide for the addition of two base camps (cabins) and nesting corrals on the southern end of the Padre Island National Seashore (PAIS) on North Padre Island, Texas.

Restoration Objectives and Performance Criteria

The overall goal of this restoration project component is to increase Kemp's ridley nest survival in Texas and Mexico. The specific restoration objectives relevant for this monitoring plan are to: (1) Construct two base camps (cabins and corrals) at the southern end of North Padre Island (Figure B- 22); (2) Enhance Texas nesting and hatchling protection (Figure B- 22); and (3) Enhance Mexico nesting and hatchling protection (Figure B- 23).

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)) or adaptive management are described below.

Performance Criteria:

- Successful construction of the PAIS cabins and corrals.
- Reduce sea turtle hatchling mortalities through continued support for nest detection and protection activities in Texas as part of the ongoing Kemp's ridley recovery efforts.

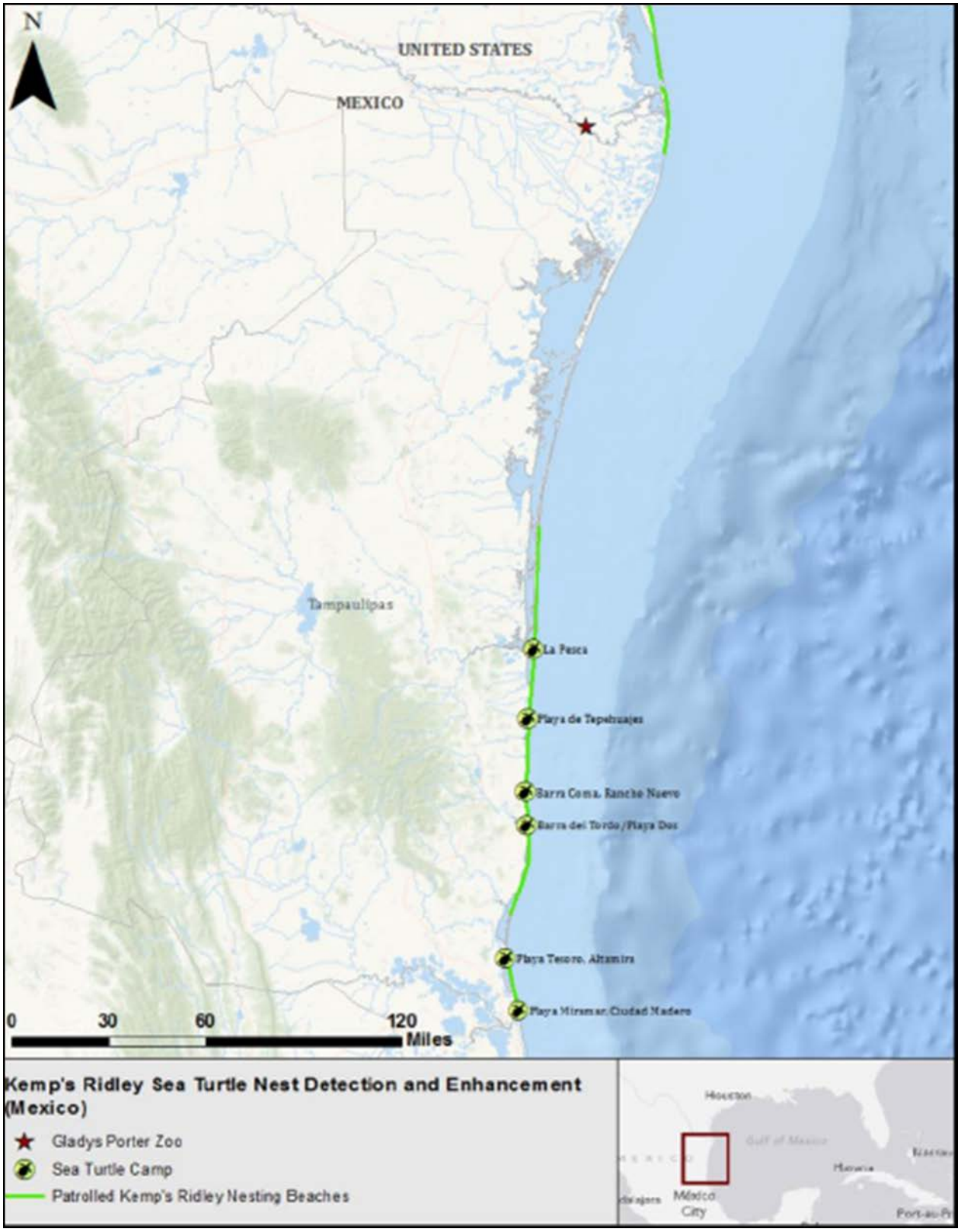
- Reduce sea turtle hatchling mortalities through continued support for nest detection and protection activities in Mexico as part of the ongoing Kemp's ridley recovery efforts.

The Implementing Trustees will work with the various partners participating in the project component and sub-components to identify corrective actions needed to help achieve success. Corrective actions will be part of an adaptive management process in which the implementing Trustees and project partners may evaluate information obtained as part of this project and other projects or datasets to inform future actions or modifications to this plan. This allows for flexibility to maximize performance for this project under changing conditions.

Figure B- 22. Kemp's Ridley Sea Turtle Nest Detection and Enhancement (Texas)



Figure B- 23. Kemp's Ridley Sea Turtle Nest Detection and Enhancement (Mexico)



Roles and Responsibilities

The Texas Trustees through Texas Parks and Wildlife Department and the Department of the Interior ("DOI") through the U.S. Fish and Wildlife Service and the National Park Service ("NPS") are the implementing Trustees for the Kemp's Ridley Sea Turtle Nest Detection and Enhancement Project Component. The implementing Trustees will be responsible for overseeing the implementation of the project components, establishing agreements with the various State, Federal, NGO and Academic partners participating in the Texas nest detection and protection program to implement project activities and provide data, interim reports, quarterly reports and annual reports as necessary.

The Implementing Trustees agree to implement this Project Monitoring Plan, and BPXP or its representative will be provided an opportunity observe all aspects of the monitoring data collection to the greatest extent practicable under applicable laws based on Trustee safety requirements, permit conditions, Trustee knowledge of the scheduling of monitoring activities, and site-specific conditions. Implementing Trustees will make reasonable efforts to facilitate the ability of BPXP to observe data collection by third parties and provide the schedules of any such activities to BPXP promptly upon their receipt by the Trustees. Implementing Trustees agree to provide BPXP with the data and information generated under the Monitoring Plan, including raw data, as described in and in accordance with the terms and conditions set forth below.

B.10.2 Project Monitoring

The proposed monitoring for this restoration project type, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, and sites. In addition, example performance criteria for each parameter are identified (if applicable), including example corrective actions that could be taken if the performance criteria are not met. The parameters listed below may or may not be tied to performance criteria and/or corrective actions. The implementing Trustees will also evaluate the outcome of each year's activities to determine if any changes in monitoring protocols are needed. If changes are needed, the Trustees will update the Project Monitoring Plan to describe any modifications.

Objective #1: Construct two base camps (cabins and corrals) at the southern end of North Padre Island

- Did the project achieve its design criteria?
- Is the projected structure being maintained?

Parameter #1: Structural integrity of cabins and corrals on PAIS

(d) Method: The Implementing Trustees will work with NPS to review construction documents and will verify final construction and that the facilities are functioning safely and as intended.

(e) Timing and Frequency:

i. During cabin and corral construction: Quarterly

ii. After completion of construction: annual reports

(f) Sites: Cabins and corrals will be located near the PAIS 30 and 50-mile marks.

(g) Performance Criterion: Successful construction of cabins and corrals to engineering and design specifications

(h) Data Product(s):

i. As-built construction drawings, final construction inspection report, and photographs will be used to document the construction activities.

ii. Annual inspections and maintenance report will document if structures are functioning as intended.

Objective #2: Enhance Texas nesting and hatchling protection

- Is program support for nest detection and protection activities in Texas reducing sea turtle hatchling mortalities?

Parameter Set #1: Level of effort for nest detection: Number and frequency of nests detected, Miles of beach patrolled

(a) *Method*: This project component will utilize nest detection and protection program data as well as supplemental labor and funding information.

(b) *Timing and Frequency*: Annual report summarizing the level of effort data for nest detection, and once, within 60 days of the start of the project, a report summarizing the previous 5 years of Level of Effort Data to the extent such data is available.

(c) *Sites*: Texas nesting beaches

(d) *Performance Criterion*: Maintain or increase level of effort for nest detection

(e) Data Product(s):

Number of miles patrolled

Hours spent patrolling

Number of personnel patrolling

Nest Reporting Forms

Parameter Set #2: Level of effort for nest protection: Number of nests protected, Number of eggs protected and/or relocated

(a) ***Method*: This project component will utilize nest detection and protection program data as well as supplemental labor and funding information.**

(b) ***Timing and Frequency*: annual data during and after project implementation**

i. Preliminary (i.e., unvalidated) data

(1) Daily nesting reports once nesting begins and concluding with the end of nesting.

(2) Nest Reporting forms provided annually with annual report

ii. Validated data: annual data summary report for nest protection period.

(c) ***Sites*: Texas nesting beaches**

(d) ***Performance Criterion*: Maintain or increase level of effort for nest protection**

(e) ***Data Product(s)*:**

i. Validated and unvalidated data:

Date of first and last nesting in a calendar year

Texas clutch number

Location (non-GPS)

Date detected

Time detected

Total number of eggs at nest excavation

Observers to note on field forms when indications of nest predation are observed

Number of broken eggsEggs incubated (incubation facility, corral)

Parameter #3: Hatchlings in incubations facilities and corrals

(a) ***Method*: Hatching and emergence success are quantified using equations from the standard techniques manual titled Research and Management Techniques for the Conservation of Sea Turtles (Miller, 1999).**

(b) ***Timing and Frequency*: annual data during and after project implementation**

i. Preliminary (unvalidated) Data:

(1) Clutch Reporting forms provided within 30 days of the conclusion of nesting season.

(2) The number of reporting forms completed will be reported to BPXP on a monthly basis after the first nest detection until the last nest is recorded.

ii. Validated data:

(1) Annual data summary report for nest incubation period

(c) *Sites*: At incubation facilities and corrals on Texas nesting beaches

(d) *Performance Criterion*: Avoid hatchling mortalities through nest detection and protection

(e) *Data Product(s)*: Completed, redacted, unvalidated field forms (included in Appendix A) will be provided to BPXP within 30 days of the conclusion of nesting season. Validated field forms will be provided to BPXP within 90 days of the date that unvalidated field forms are provided to BPXP, or within 14 days of the completion of validation, whichever is sooner.

Parameter Set #4: Influential events effecting this objective, including date, location, and description of environmental conditions relevant to nesting activities

(a) *Method: This project* component will report on influential events for the nesting season

(b) *Timing and Frequency*: annual data during and after project implementation

(c) *Sites*: Texas nesting beaches

(d) *Data Products*:

Summary report documenting extreme weather or other events that could affect nesting success or the documentation thereof. This could include hurricanes and tropical storms, the number of estimated nests lost due to events, lost patrol days The Implementing Trustees will use reasonable efforts to collect data on influential events affecting this project, including the following data types, all of which shall be included in the report if recorded:

Date of first nesting
Date of last nesting
Date of significant storm
Date and nest inundation
Number of nests predated
Number of eggs lost predation

Objective #3: Enhance Mexico nesting and hatchling protection

- Is program support for nest detection and protection activities in Mexico reducing sea turtle hatchling mortalities?

Parameter Set #1: Level of effort for nest detection: Number and frequency of nests detected, miles of beach patrolled

(a) ***Method*: This project component will utilize nest detection and protection program data as well as supplemental labor and funding information.**

(b) ***Timing and Frequency*: Annual report summarizing of level of effort data for nest detection period, and once, within 60 days of the start of the project, a report summarizing the previous 5 years of Level of Effort Data to the extent such data is available.**

(c) ***Sites*: Mexican nesting beaches**

(d) ***Performance Criterion*: Maintain or increase level of effort for nest detection**

(e) ***Data Product(s), to the extent such data is available*:**

Number of miles patrolled

Hours of patrolling

Number of personnel patrolling

Nest reporting forms

Parameter Set #2: Level of effort for nest protection: Number of nests protected in situ, and/or relocated

(a) ***Method*: This project component will utilize nest detection and protection program data as well as supplemental labor and funding information.**

(b) ***Timing and Frequency*: annual data during and after project implementation**

i. Preliminary (unvalidated) Data

(1) Daily nesting reports would be completed for the entire nesting season

(2) Nest reporting forms provided annually with annual report

ii. Validated data: annual data summary report for nest protection period

(c) ***Sites*: Mexico nesting beaches**

(d) ***Performance Criterion*: Maintain or increase level of effort for nest protection**

(e) ***Data Product(s)*:**

i. Validated and unvalidated data, to the extent such data is available to the Trustees:

Date of first and last nesting

Mexico clutch number

Location (non-GPS)

Date detected

Time detected

Total number of eggs at nest excavation

Observers to note on field forms when indications of nest predation are observed

Number of broken eggs

Eggs Incubated (corral, in-situ)

Parameter #3: Total hatchlings in corrals

(a) ***Method*: Hatching and emergence success are quantified using equations from the standard techniques manual titled Research and Management Techniques for the Conservation of Sea Turtles (Miller, 1999).**

(b) ***Timing and Frequency*: annual data during and after project implementation**

i. Preliminary (unvalidated) data

(1) Clutch reporting forms provided within 30 days of their receipt by the Trustees

ii. Validated data:

(1) Annual data summary report for nest incubation period

(c) ***Sites*: At corrals on Mexican nesting beaches**

(d) ***Performance Criterion*: Avoid hatchling mortalities related through nest detection and protection**

(e) ***Data Product(s)*: Completed, unvalidated field forms (included in Appendix A) will be provided to BPXP within 30 days of their receipt by the Trustees. Validated field forms will be provided to BPXP within 90 days of the date that unvalidated field forms are provided to BPXP.**

Parameter Set #4: Influential events effecting this objective, including date, location, and description of environmental conditions relevant to nesting activities

(a) ***Method*: report on influential events for the nesting season**

(b) ***Timing and Frequency*: annual data during and after project implementation**

(c) ***Sites*: Mexican nesting beaches**

(d) ***Data Products*: Summary report documenting extreme weather or other events that could affect nesting success or the documentation thereof. This could include hurricanes and tropical storms, the number of estimated nests lost due to events, number of nests predated, and number of eggs lost due to predation. Implementing Trustees will use reasonable efforts to collect data on influential events affecting this project, including the following data types, all of which shall be included in the report if recorded:**

(e) **Date of first nesting**

Date of last nesting
Date of significant storm
Date and nest inundation
Number of nests predated
Number of eggs lost predation

Monitoring Schedule

The schedule for the project monitoring is shown in Table B- 19, separated by monitoring activity. Pre-Project Monitoring refers to obtaining existing historical information. Project Start-Up Monitoring is the planning and initial activities that will occur prior to the implementation of the field efforts. Performance monitoring will begin once agreements are in place between the implementing Trustees and the project partners.

Table B- 19. Monitoring Schedule

Monitoring Activity	Pre-Project Monitoring	Project Start-up Monitoring	Performance Monitoring Year 1-10
Construct two base camps (cabins and corrals) at the southern end of North Padre Island			
Construction certification			X
Maintenance reports-annually			X
Enhance Texas nesting and hatchling protection			
Level of effort for nest detection			X
Level of effort for nest protection			X
Hatchlings in incubations facilities and corrals			X
Influential events			X
Enhance Mexico nesting and hatchling protection			
Level of effort for nest detection			X
Level of effort for nest protection			X
Hatchlings in corrals			X
Influential events			X

B.10.3 *Reporting and Data Requirements*

This section describes the process the implementing Trustees and project partners will follow to document, validate and report field data collected for the purposes of performance monitoring. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data;
- Organize, track, locate, and access monitoring data over the long-term; and
- Share finalized monitoring data with the public in a consistent and comprehensible format

Data Reporting

The Implementing Trustees shall provide annual status reports describing the status of and any changes to the Early Restoration Project Component and/or project Component expenditures during each calendar year. The Implementing Trustees shall provide annual status reports until the applicable performance criteria, monitoring, and maintenance period has expired or by the agreed upon stipulations for the sea turtle early restoration project, whichever comes first.

Annual reporting will cover from January 1st to December 31st of each restoration year. The first annual report will cover the calendar year following the year in which this stipulation is filed. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. Some data may not be available within this time-period, and will be provided within 6 months after the conclusion of the annual reporting year. Reported data and all data that is available to the public will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information.

Data for this component will be analyzed, in part, by evaluating trends related to Kemp's ridley nesting activities that occur during the current monitoring period of this component in comparison to previous reporting periods from this project. Data collected during component implementation will not be compared to historical data due to inconsistencies in historical data collection and methodologies.

The implementing Trustees will develop a final project summary at the conclusion of the 10-year project period which will detail the overall accomplishments of the project.

Data Documentation

The majority of data collected for this project component will be reports of sea turtle nesting and hatchling releases conducted by the Texas and Mexico sea turtle nest detection and protection programs, which will be made available to BPXP at the times listed in this monitoring plan. To the extent possible, all environmental and biological data generated during monitoring activities will be documented using existing standardized report forms and established field protocols.

Where and when applicable, all tangible forms of data may be reviewed by the Implementing Trustees for completeness and accuracy before being finalized. Original hardcopy report forms and other relevant data including photographs will be maintained by the programs in a secure location in accordance with agency and litigation-hold requirements. While the Trustees will be relying on data from existing programs, only aggregated summary data will be incorporated in annual reports.

Data Transcription, Verification, Validation and Analysis

Data collected by currently existing programs are subject to the existing verification procedures of the programs from which the data originate.

Data generated by this project component will be reviewed by the appropriate implementing Trustee (DOI and Texas) for completeness and accuracy before being finalized. Originals or copies (to be decided

by the implementing Trustee) of the data collected, which may include but is not limited to datasheets, notebooks, and photographs (which may be in the form of photo micro SD cards) will be retained by the federal or state programs that collected the data and stored in a secure location in accordance with agency and applicable litigation-hold requirements. Any data that is transferred to the implementing Trustees by non-state and non-federal project participants will be retained by the implementing Trustee and stored in a secure location in accordance with agency and applicable litigation-hold requirements. Prior to data collection efforts, the implementing Trustees will decide where the original documents and copies of those documents will be stored.

When the data transcription and verification/validation processes are complete, electronic datasets can be used for data analysis. Analyses will be conducted by the implementing Trustees to derive Project monitoring performance criteria metrics.

Data Sharing

The Trustees agree to provide BPXP with all data and information in the Trustees' possession or control generated by the Project Monitoring activities described above.

The phrase "all data and information" used in paragraph 4.4.1 above includes: all field data, e.g., measurements, observational data, and field notes; laboratory toxicity testing; any other laboratory data; spatial data; photographs; videos; images; and any other data and information generated by an activity, including field-generated metadata.

The Implementing Trustees will provide all raw data (with redactions, if required by applicable law) from the Texas activities in this Plan to BPXP within 30 days of the conclusion of nesting season. For the Mexico activities in this Plan, the Trustees will provide all raw data to BPXP within 30 days of its receipt by the Trustees. Raw data will be subject the following limitations on public use and disclosure:

BPXP will keep the raw data provided pursuant to this plan confidential, and will require that any BPXP consultants, experts or employees who review the data agree to keep the materials confidential.

BPXP will not publish any studies based on the raw data provided pursuant to this plan, unless the data has been made publicly available.

Notwithstanding the terms of paragraphs 4.4.3.1 and 4.4.3.2 above, BPXP may use the raw data provided pursuant to this plan:

(a) In any legal or administrative proceedings relating to the Incident, including but not limited to, the NRDA of the Incident or MDL No. 2179 in the United States District Court for the Eastern District of Louisiana; and

(b) In a public discussion or disclosure of the raw data that is made in response to Trustee or third party public statements about these activities, or results of the activities that produced the raw data, provided, however, that BPXP will notify the

Implementing Trustees at least seven (7) days prior to using the data the extent such data has not been previously made public.

(c) Any use, discussion or disclosure of the unvalidated field forms shall be accompanied by a statement that the data is "preliminary."

To the extent that the Implementing Trustees validate some or all of the information contained in the field forms, the Implementing Trustees shall provide BPXP with validated field forms for the Texas activities in this Plan within 90 days of their production to BPXP of the unvalidated Texas field forms, or 14 days after completion of the validation, whichever is sooner. The Trustees shall provide BPXP with validated field forms for the Mexico activities in this Plan within 90 days of their production to BPXP of the unvalidated Mexico field forms.

Nothing in this plan shall be construed as a waiver of any party's right to object to the admissibility or relevance of data produced under this plan and each party reserves the right to undertake its own analysis and interpretation of the data.

B.10.4 References

National Park Service. 2013. Texas Sea Turtle Manual. March 2013.

Miller, J.D. 1999. Determining clutch size and hatching success. In: Research and Management Techniques for the Conservation of Sea Turtles, p. 124-129. K.L. Eckert, K.A. Bjorndal, F.A. Abreu-Grobois, and M. Donnelly (editors). IUCN/Marine Turtle Specialist Group, Publication No. 4.

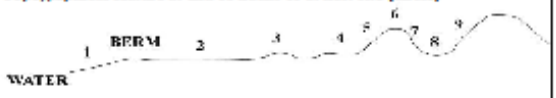
Appendix A: Field Forms

TEXAS DATA SHEET FOR SEA TURTLE TRACKS AND NESTS

TEXAS CLUTCH NUMBER: _____ **SPECIES:** _____
PROJECT ID: _____ **LOCATION:** _____

General Information
Date detected: _____ Time detected: _____ am/pm Wind speed/direction: _____
Found by: _____ (turtle patroller, beach worker or visitor) Which found: ____ Nest
First investigated by: _____ (check one) ____ False crawl Grid #: _____
Specific location: _____ ____ Unknown (tracks ended in soft sand)
_____ Turtle seen by (circle): visitor - patroller - responder

Track Information
Flipper impressions: ____alternate ____opposite
Width of Tracks: _____ cm
Estimated age of tracks (if no female present): _____
Topographical feature at end of tracks or at nest site (circle)



1-forebeach, 2-backbeach, 3-embryonic dunes, 4-base of foredunes, 5-upslope of first foredune, 6-top of first foredune, 7-downslope of first foredune, 8-foredune depression, 9-upslope of second foredune

Nest Information
Was a nest found? ☐Yes ☐No
Nest GPS (dd.ddddd°): _____N _____W
Date and time eggs excavated: _____
Eggs excavated by: _____
Eggs transported by: _____

Total number of eggs at nest excavation: _____
# of tiny eggs _____
of "normal size" eggs: _____
of broken eggs: _____
Describe any conjoined or otherwise abnormal eggs:
_____

Eggs Incubated (check one):
____Incubation Facility
____Corral
____In-situ

Date & time eggs placed in incubation facility/corral: _____
Placed in incubation facility/corral by: _____
Temperature datalogger placed in nest? ☐Yes ☐No
Datalogger ID #: _____
Temperature probe placed in nest? ☐Yes ☐No

Additional remarks, comments, data, or sketches on tracks, turtle, nest site on back of form? ☐**Yes** ☐**No**
If no nest is found, record GPS of highest point of tracks and describe/draw below.

Notify immediately, fax, and mail originals to:
Dr. Donna Shaver, Padre Island National Seashore
P.O. Box 181300, Corpus Christi, TX 78480-1300
Office (361) 949-8173 ext. 226; fax (361) 949-9134

Turtle Information
Action when first encountered turtle (circle):
emerging - digging - laying - covering - returning to sea

Orientation of turtle when laying eggs:
(12 o'clock facing inland, 6 o'clock facing towards sea): _____

Scanned for **PIT Tag**? ☐Yes ☐No
***APPLY ALL TAGS TO LEFT FLIPPERS IN TEXAS**

Left Front (Present or Applied): _____
(if applied, attach sticker)

Right Front (Present or Applied): _____
(if applied, attach sticker)

Checked for **Metal Tags**? ☐Yes ☐No
***APPLY ALL TAGS TO LEFT FLIPPERS IN TEXAS**
Left Front: _____ Present or Applied (circle)
Right Front: _____ Present or Applied (circle)
Left Rear: _____ Present or Applied (circle)
Right Rear: _____ Present or Applied (circle)
Metal Tag Scars (list location, describe): _____

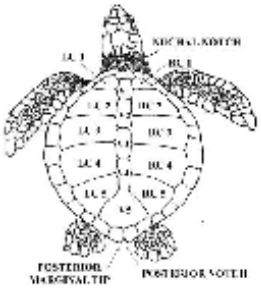
Carapace measurements **using metal calipers (SLCL)**:
Straight length (notch-tip): _____ cm
Minimum length (notch-notch): _____ cm
Straight width (widest point): _____ cm
Carapace measurements **using non-metal measuring tape**:
Curved length (notch-tip): _____ cm
Minimum length (notch-notch): _____ cm
Curved width (widest point): _____ cm

Scanned for **Coded Wire** (Magnetic) **Tag**? ☐Yes ☐No

If magnetic tag, which flipper: ____left front ____right front

Checked for **Living Tag**? ☐Yes ☐No
Was carapace scrubbed? ☐Yes ☐No

Record location and deformities (mark, describe, photograph):
LC = left costal, V = vertebral, RC = right costal



Transmitter ID #
_____
Present or Applied (circle)

Samples:
Biopsy-tissue? ☐Yes ☐No

PADRE ISLAND NATIONAL SEASHORE, DIVISION OF SEATURTLE SCIENCE AND RECOVERY

CLUTCH INFORMATION DATA SHEET

Clutch # _____
Lay Date: _____
Hatch Date & Time (All or Part A):_____
A: Incubation Duration (# Days):_____
Hatch Date & Time (Part B):_____
B: Incubation Duration (# Days):_____
Hatch Date & Time (Part C):_____
C: Incubation Duration (# Days):_____

Eggs broken pre-incubation:_____
Eggs in Clutch (initial): _____
Eggs in Clutch (final): _____
Eggs Hatched: _____
% Hatched : _____ = $\frac{\#\text{ hatchlings}}{\#\text{ eggs}}$

% Emergence: _____ = $\frac{\#\text{ live hatchlings}}{\#\text{ eggs}}$
# Unhatched eggs: _____
# Dead Hatchlings*: _____
# Live Hatchlings Released: _____
# Live Hatchlings Held Long Term: _____
* Hatchlings are individuals that have left their egg shells

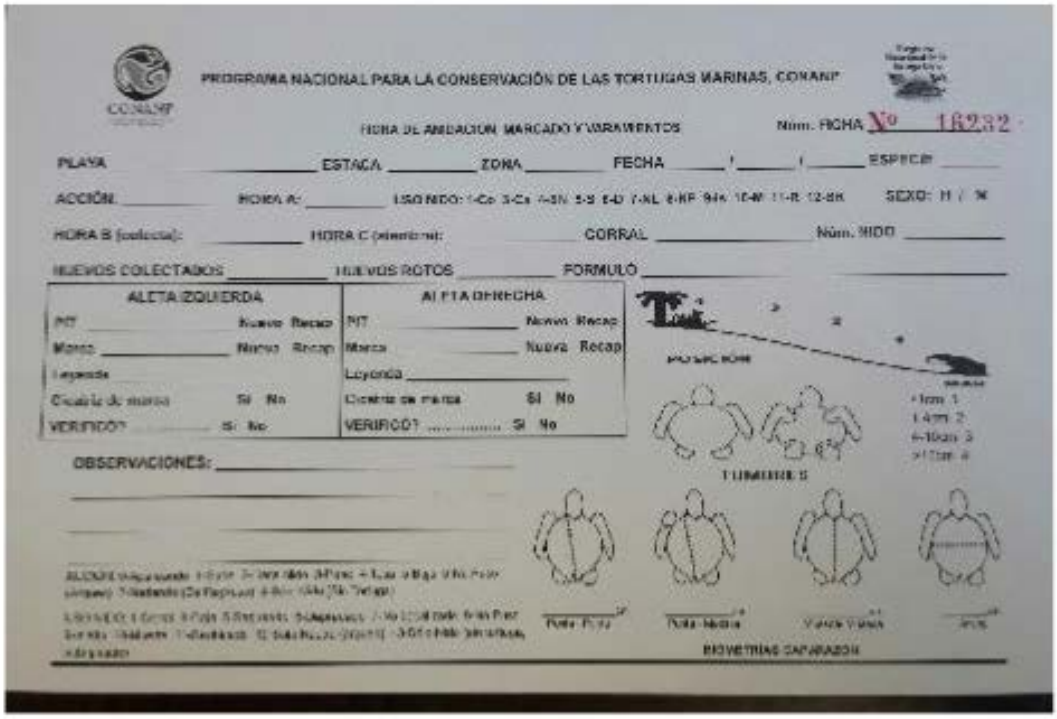
Transfer Information:

Number	Date	Time	Activity

Release Information:

Number	Date	Time	# Retrieved	Fate

Comments:



PLAYA = BEACH

ESTACA = KILOMETER MARKER

ZONA = ZONE

FECHA = DATE

ESPECIE – SPECIES

ACCION = ACTION

What the turtle was doing when first spotted – the actions are at the bottom of the data card:

0 = mating	1 = arriving to the beach	2 = making the nest
3 = laying eggs	4 = covering the nest	5 = leaving the beach
6 = false crawl (did not lay eggs)	7 = swimming back	8 = nest only (no turtle)

HORA A = TIME A

Time when the turtle (or nest) was first spotted

B.11 Sea Turtle Early Restoration Project Component B: Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program

B.11.1 Introduction

This document presents the monitoring plan for the Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program Project Component (Plan), which is a component of the Sea Turtle Early Restoration Project. This project component is included as a Phase IV *Deepwater Horizon* early restoration project that is intended to contribute to making the environment and public whole for injuries to sea turtles. This Plan describes the monitoring activities that will be conducted to evaluate and document the effectiveness at meeting restoration objectives, including the performance criteria that will apply to determining the success of restoration or need for interim corrective action (15 CFR §990.55(b)(1)(vii)).

This Plan is specific to the Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program component and should not be generalized beyond this. Other monitoring plans and designs may be appropriate in other contexts. The compilation of data under this Plan will not occur until funding under a filed restoration funding agreement for the Sea Turtle Early Restoration Project (Stipulation) has been received. This Plan will be implemented by the Texas Trustees1[9], the Department of Interior (DOI), and National Oceanic and Atmospheric Administration (NOAA) and may be modified over time based on the management needs for the project.

This Plan is intended to apply to the performance monitoring activities included herein. BP Exploration & Production, Inc. ("BPXP") and the Trustees agree that they will include this Plan in the final Project Stipulation for the Sea Turtle Early Restoration Project.

Project Overview

Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program component (Component) will maintain and enhance the Sea Turtle Stranding and Salvage Network (STSSN) beyond current capacities for 10 years and develop a formal Sea Turtle Emergency Response Program within the Gulf of Mexico (Figure B- 24). The goal of this

[9] The Texas Trustees include the Texas Commission on Environmental Quality, Texas General Land Office, and Texas Parks and Wildlife Department (TPWD).

Component is to improve response capabilities to quickly recover dead and injured sea turtles and improve data quality and accessibility.

Enhancement of the Sea Turtle Stranding and Salvage Network Sub-Component

This sub-component includes two separate sets of activities: (1) Enhancement of the Gulf-Wide Sea Turtle Stranding and Salvage Network and (2) Enhancement of the Sea Turtle Stranding and Salvage Network and Rehabilitation Efforts in Texas, as described below.

Enhancement of the Gulf-Wide Sea Turtle Stranding and Salvage Network

This sub-component would enhance the infrastructure of the Gulf of Mexico STSSN across the five Gulf states to improve the capacity for response, coordination, data handling and reporting, and data dissemination related to strandings for use in sea turtle conservation management programs. The goal of this sub-component is to provide for more rapid response to stranding events, so that mortality sources may be identified and addressed more rapidly and solutions implemented where possible. This sub-component will be implemented by NOAA, with partners including the STSSN state coordinators for each of the five Gulf states.

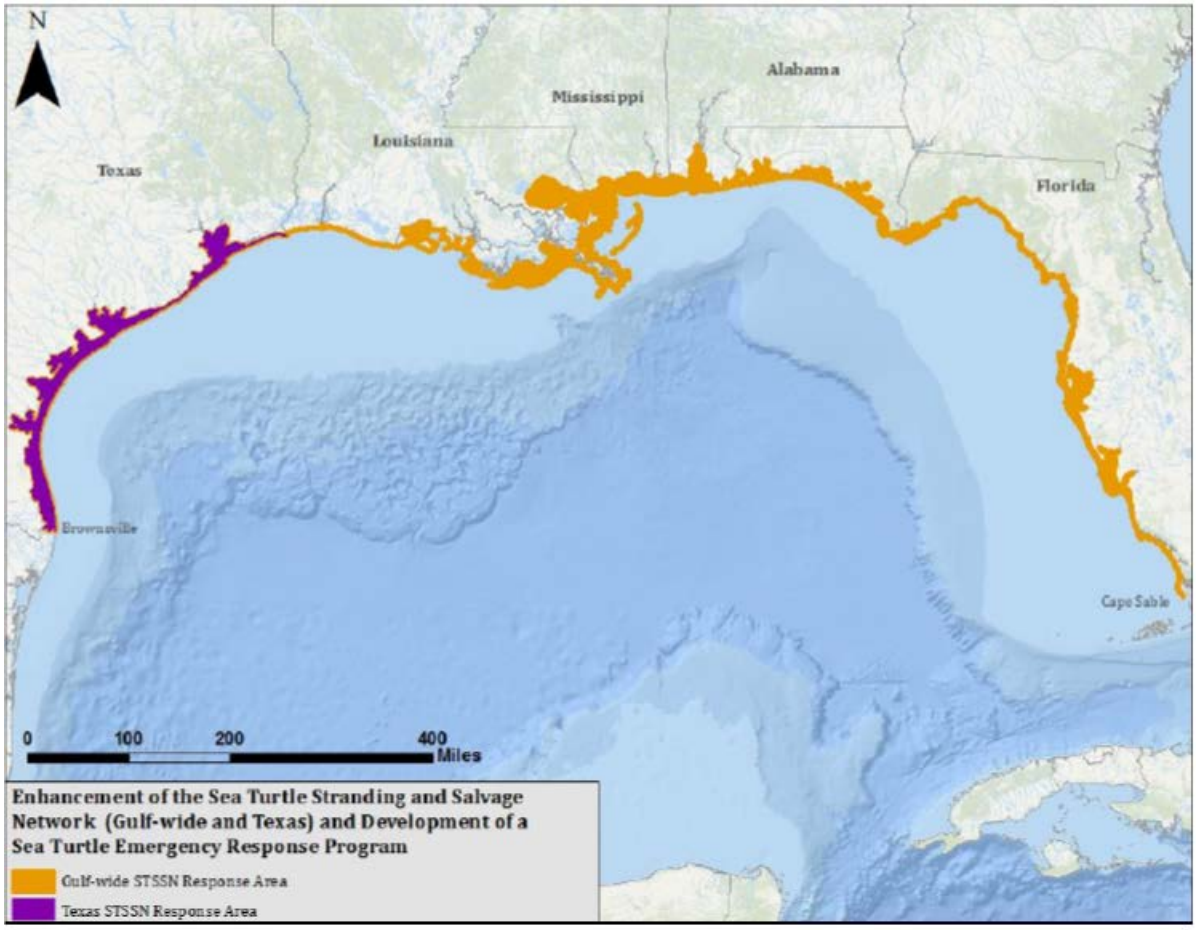
Enhancement of the Sea Turtle Stranding and Salvage Network and Rehabilitation Efforts in Texas

This sub-component would enhance the STSSN within Texas by expanding the capacity of the network in Texas through funding to the STSSN partner organizations and rehabilitation providers. The goal of this sub-component is to replace lost funding and expand the STSSN's capacity to respond to strandings on Texas beaches, in order for more turtles to be found, rehabilitated, and released. This sub-component will be implemented by DOI and the Texas Trustees, with partners including the participating organizations in the TX STSSN.

Development of a Sea Turtle Emergency Response Program Sub-Component

This sub-component is to develop and implement a comprehensive Sea Turtle Emergency Response Program in the Gulf of Mexico. The primary implementation actions are to create a formal response plan and to provide the necessary infrastructure (i.e. supplies and equipment). The goal of this sub-component is to increase the STSSN's capacity to respond to cold stun and other emergency events that may kill or injure large numbers of sea turtles to increase the survival of live stranded sea turtles. The program design will be focused on increasing response capacity and increasing the extent of search areas during emergency events. This sub-component will be implemented by NOAA.

Figure B- 24. The project area for the Enhancement of the Gulf of Mexico Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program



Restoration Objectives and Performance Criteria

The specific restoration objectives for this Component that are relevant to this monitoring plan and the performance criteria to be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)) or adaptive management are described below.

Enhancement of the Sea Turtle Stranding and Salvage Network – Gulf-wide STSSN Activities Subcomponent (Implemented by NOAA)

Objective 1: Enhance the STSSN to improve response capacity, monitoring, and data collection/accessibility/timeliness

Performance Criteria:

- At end of Year 1, STSSN positions will be hired or funded, and are operational to support the Gulf-wide STSSN (one in each state STSSN program and 3 within NOAA)

- At end of Year 1, start-up equipment has been purchased for STSSN staff

- Each year necropsies will be completed on dead stranded sea turtles following improved necropsy protocols allowing for more consistency in analysis, when and where applicable

- Each year the need for training programs will be evaluated and where needed training will be offered to the STSSN

Enhancement of the Sea Turtle Stranding and Salvage Network – Texas STSSN Activities Sub-component (Implemented by DOI and Texas Trustees)

Objective 2: Decrease sea turtle mortality by expanding the ability to find and rehabilitate injured sea turtles in Texas

Performance Criteria:

- Each year maintain or increase level of survey effort for the number of team survey hours, personnel hours spent patrolling Texas beaches by type (shore or in-water), and the number and frequency of patrols by defined areas

- Each year maintain or increase level of effort recovering and treating injured and stranded sea turtles

Development of a Sea Turtle Emergency Response Program (Implemented by NOAA)

Objective 3: Implement a program to enhance response to emergency events and reduce mortality of sea turtles affected by these events:

Performance Criteria:

- At end of Year 1, new Mobile Aquatic Sea Turtle Holding (MASH) units have been built-out and staged and are ready for use in the Gulf of Mexico

- Increase response capacity during cold stun and other emergency events. Reduce sea turtle mortality due to emergency events, document number of strandings and the sea turtle disposition post-event.

Roles and Responsibilities

NOAA is the Implementing Trustee for Enhancement of the Gulf-wide STSSN and the Development of a Sea Turtle Emergency Response Program. DOI and the Texas Trustees are the Implementing Trustees for the Texas-only portion of the Enhancement of the STSSN.

Field activities for this Component will be implemented by the STSSN. The National Marine Fisheries Service (NMFS), part of NOAA, is the primary coordinator for the STSSN and is responsible for ensuring that data are collected in a manner sufficient for conservation management, monitoring, and research purposes and to facilitate its use to meet recovery objectives.

The STSSN includes federal, state and private partners, and is coordinated by NMFS. Each state has a STSSN State coordinator responsible for coordinating the stranding network within their state. The agencies that host the state coordinator by state are; National Park Service for the Texas STSSN, Louisiana Department of Wildlife and Fisheries for the Louisiana STSSN, NMFS for the Mississippi STSSN, United States Fish and Wildlife Service for the Alabama STSSN, and Florida Fish and Wildlife Conservation Commission for the Florida STSSN.

The STSSN documents each stranding on a standardized stranding report form, where specific data are recorded for each stranding event (Appendix A). Each stranding is photo documented, unless circumstances preclude acquiring photographs. All photos and stranding forms are submitted to NMFS for data validation and archival. Current STSSN procedures for data transfer and validation will be used for this Component, and data collected will be further used by the Implementing Trustees to monitor the project.

NOAA and the Texas Trustees will evaluate data collected for the Sub-component for which they are the Implementing Trustee, and will develop status reports that are available to the public.

The Implementing Trustees (DOI, NOAA, and Texas Trustees) will work with the partners participating in implementation of Component activities and where appropriate to identify corrective actions needed to help achieve success. Corrective actions will be part of an adaptive management process in which the Implementing Trustees and Component partners will evaluate information obtained as part of this project and other projects or datasets to inform planning of future actions. This allows for flexibility to optimize performance of the STSSN efforts under changing conditions to achieve success.

The Implementing Trustees agree to implement this Project Monitoring Plan, and BPXP or its representative will be provided an opportunity to observe all aspects of the project monitoring and monitoring data collection activities to the greatest extent practicable under applicable laws based on Trustee safety requirements, permit conditions, the Trustee's knowledge of the scheduling of monitoring activities, and site-specific conditions. Trustees will make reasonable efforts to facilitate the ability of BPXP to observe data collection by third parties and provide the schedules of any such activities to BPXP promptly upon their receipt by the Trustees. Trustees shall provide BPXP with the data and information generated under the Monitoring Plan, including raw data, as described in and in accordance with the terms and conditions set forth below.

B.11.2 Project Monitoring

The monitoring for this Component, outlined below, is organized by objective, with monitoring parameters specified for each objective. For the monitoring parameters listed below, information is provided on the monitoring methods, timing and frequency, and sites. Performance criteria are described for parameters that directly evaluate project objectives. Performance criteria are not identified for additional monitoring parameters where data will only be used to inform adaptive management to help ensure the success of the project.

Implementing Trustee(s) will also evaluate the outcome of annual activities to determine if any changes in monitoring protocols are needed. If changes are needed, the Implementing Trustee(s) will update this Plan to identify and describe modifications. Any changes to procedures must be compliant with all active agreements.

Performance monitoring will be used to evaluate the effectiveness of the project in meeting the established restoration objectives and assist in determining the need for corrective actions.

Additional monitoring may be completed to support project management by identifying potential factors influencing project success. To evaluate the success of this Component, data collected over the 10-year duration will be evaluated in comparison to the project objectives.

In some cases, this Component involves the initiation of new activities, and in other cases, this Component is replacing or enhancing existing funding and Programs. Therefore, data collected as part of this Component will not be evaluated against baseline conditions in all cases.

Enhancement of the Sea Turtle Stranding and Salvage Network – Gulf-wide STSSN Activities (Implemented by NOAA)

Objective #1: Improve sea turtle stranding and response networks to enhance response capabilities and data collection/accessibility/timeliness

- Has the STSSN been improved?
- Have the response capabilities, monitoring, and data collection, accessibility, and timeliness of the STSSNs been enhanced?

Parameter #1: Number of STSSN staff hired and operational

(a) Method: Track hiring and funding of staff to fill stranding program positions (1 position in each of the 5 Gulf Coast states; 3 positions at the NOAA STSSN coordination level)

(b) Timing and Frequency: One-time assessment at the end of project Year 1

(c) Sites: Gulf-wide

(d) Performance Criteria: At end of Year 1, staff will be hired or funded and are operational to support the Gulf-wide STSSN (one in each state STSSN program and 3 within the NOAA STSSN)

(e) Data Product(s): Report of STSSN network structure documentation, including staff hired, number of days worked with project funds, and general work schedule (i.e. part-time, full-time, seasonal).

Parameter #2: Inventory of start-up equipment purchased

(a) Method: Track expenditures of large-scale start-up equipment for stranding staff (i.e. vehicles, computers).

(b) Timing and Frequency: One-time assessment at the end of project Year 1

(c) Sites: Gulf-wide

(d) Performance Criteria: At end of Year 1, start-up equipment has been purchased for STSSN staff

(e) Data Product(s): Inventory of start-up equipment expenditures, and maintenance schedule, summary of annual maintenance, repair and replacement expenditures will be included in the annual report.

Parameter #3: Number of necropsies completed (including field necropsies) for dead-stranded sea turtles

(a) Method: Data will be sourced from the Gulf-wide STSSN. Data will be aggregated in accordance with existing STSSN data management procedures.

(b) Timing and Frequency: Quarterly provide data listed below in (e) for the life of the project.

(c) Sites: Gulf-wide

(d) Performance Criteria: Each year necropsies will be completed (including field necropsies) on dead stranded sea turtles following improved necropsy protocols allowing for more consistency in analysis, when and where applicable

Data Product(s): Compilation of Gulf-wide STSSN necropsy data. Copies of necropsy forms and data redacted as necessary will be provided. Validated necropsy reports will be provided quarterly with a one quarter lag to allow for validation of the reports, (i.e., by the end of the second quarter, June 30, the Trustees will provide the validated necropsy reports completed from January 1 through March 31 of the same year, etc.).

Parameter #4: Training programs provided

(a) Method: Data will be sourced from the Gulf-wide STSSN and NOAA

(b) Timing and Frequency: Annually provide data listed below in (e) for the life of the project.

(c) Sites: Gulf-wide

(d) Performance Criteria: Each year, the need for training programs will be evaluated, and where needed, training will be offered to the STSSN.

(e) Data Product(s): Report of training provided to the STSSN by NOAA and/or the State coordinators, including the total number of training programs conducted, location, hours, and type of training.

Enhancement of the Sea Turtle Stranding and Salvage Network – Texas STSSN Activities (Implemented by DOI and Texas Trustees)

Objective #2: Decrease sea turtle mortality by expanding the ability to find and rehabilitate injured sea turtles in Texas.

- Were response efforts able to decrease sea turtle mortalities?

Parameter #1: Documentation of restoration funding agreement between Implementing Trustees and project partners.

a) Method: Signed agreement. This agreement will include information on the techniques, timing and frequency, reporting requirements, and the type of data that will be collected and submitted.
b) Timing and Frequency: Prior to distribution of funds from project implementers to project partners.
c) Sites: Texas
d) Performance Criteria: Compliance with terms of active agreement between the Implementing Trustees and the project partners.
e) Data Product(s): Signed Agreements with project partners and any documentation of non-compliance with the signed agreements.

Parameter #2: Level of Survey Effort will include number of team survey hours, personnel hours spent patrolling by type of patrol, and the number and frequency of patrols by defined areas.

(a) Method: Use STSSN program data as well as labor and funding information. Where applicable, data will be collected according to standard methodologies (NPS 2013).

(b) Timing and Frequency: Annually, validated data for each calendar year would be compiled into a report, and released within 3 months of the end of each calendar year, for the duration of the monitoring period (10 years).

(c) Sites: Texas

(d) Performance Criteria: Maintain or increase the level of survey effort for the number of team survey hours, personnel hours spent patrolling, and the number and frequency of patrols by defined areas.

(e) Data Product(s): Number of team survey hours broken out by geographic survey area, number of personnel hours spent patrolling by survey area, and the number and frequency of patrols by survey area

Parameter #3: Sea Turtle Response will include numbers of injured/stranded sea turtles and numbers of sea turtles admitted for treatment

(a) Method: Use STSSN program data as well as supplemental labor and funding information. Where applicable, data will be collected according to standard methodologies (NPS 2013; Miller 1999).

(b) Timing and Frequency: Annually, validated data for each calendar year would be compiled into a report, for the duration of the monitoring period (10 years).

(c) Sites: Texas

(d) Performance Criteria: Maintain or increase the level of effort recovering and treating injured and stranded sea turtles.

(e) Data Product(s): numbers of injured/stranded /re-stranded sea turtles (if known) and numbers of sea turtles admitted for treatment, summary of injury types, rehabilitation turn-around time, total rehabilitation costs by facility, copies of rehabilitation and release files on individual turtles, Summary of rehabbed turtles that are tagged prior to release. Copy of NPS 2013 methodologies and any changes that occur during the life of the project.

Parameter #4 Influential events effecting this objective, including date, location, and description of environmental conditions relevant to stranding events

(a) Method: Use STSSN program data as well as supplemental weather information to document influential events relevant to strandings. Where applicable, data will be collected according to standard methodologies (NPS 2013).

(b) Timing and Frequency: Annually, validated data for each calendar year would be compiled into a report for the duration of the monitoring period (10 years).

(c) Sites: Texas

(d) Performance Criteria: Documentation of influential events is included in the annual reports

(e) Data Product(s): Summary report documenting extreme weather or environmental events resulting in strandings and any relevant supporting data (temperature, HABs, etc.) that is collected as part of this project.

Development of a Sea Turtle Emergency Response Program (Implemented by NOAA)

Objective #3: Implement a program to enhance response to emergency events and reduce mortality of sea turtles affected by these events

- Has a formal Emergency Response Program been established?
- Has capacity been increased to respond to emergency events?

Parameter #1: MASH Unit build-out and staging

(a) Method: Track purchase of the MASH units as well as build-out and staging of new MASH units

(b) Timing and Frequency:

i. Pre-project Monitoring: Review of historical emergency response data to determine most strategic locations for MASH unit placement.

ii. One-time assessment at the end of project Year 1.

iii. Annually, maintenance, use and location of MASH units

(c) Sites: Gulf-wide

(d) Performance Criteria:

i. At end of Year 1, new MASH units have been built-out and staged and are ready for use in the Gulf of Mexico.

ii. Annually, maintenance, use and location of MASH units sustained.

(e) Data Product(s): Inventory of equipment purchased, maintenance records, location where they are staged. Summaries of historical emergency response data (in form used by Implementing Trustees).

Parameter #2: Response capacity during cold stun or other emergency events

(a) Method: The following will be tracked: number and location of cold stun and other emergency unusual stranding events, number of vessels contracted, MASH unit readiness and location where staged, response time, search area.

(b) Timing and Frequency: Bi-annually for the life of the project.

(c) Sites: Gulf-wide

(d) Performance Criteria: Increase response capacity during cold stun and other emergency events.

(e) Data Product(s): Summary of Gulf-wide STSSN Emergency Response Program, number of times MASH units deployed and locations where they were used. Summaries will be provided bi-annually, on July 31 for the 6 month period ending June 30 of the same year, and on January 31 for the 6 month period ending December 31 of the previous year. Emergency response data will be summarized as follows:

- Date, location and duration of emergency event
- Number of MASH units deployed, where located, photographs (if taken)
- Number of vessels contracted/used for surveys

Parameter #3: Sea turtle condition following response

(a) Method: Number and condition of animals triaged and released during cold stun or other emergency unusual stranding events will be counted. Data will be sourced from

the Gulf STSSN. Data will be aggregated in accordance with existing STSSN data management procedures.

(b) Timing and Frequency: Compilation and analysis of Gulf-wide STSSN data will occur annually for the life of the project.

(c) Sites: Gulf-wide

- Performance Criterion: Reduce sea turtle mortality due to emergency events.

(d) Data Product(s): Copies of stranding forms, including final disposition information to the extent available, will be provided. Validated stranding forms will be provided quarterly with a one quarter lag to allow for validation of the forms, (i.e., by the end of the second quarter, June 30, the Trustees will provide the validated stranding forms completed between January 1 and March 31 of the same year, etc.).

Monitoring Schedule

The schedule for the project monitoring is shown in Table B- 20, separated by monitoring activity. Pre-Project Monitoring refers to obtaining existing historical information. Project Start-Up Monitoring is the planning and initial activities that will occur prior to the implementation of field efforts. Performance Monitoring for each sub-component will begin at the point agreements are in place between the Implementing Trustees and the project partners.

Table B- 20. Monitoring Schedule

Monitoring Activities	Pre-Project Monitoring[10]	Project Start-up Monitoring	Performance Monitoring Years 1 - 10
NOAA's Enhancement of the Gulf Wide Sea Turtle Stranding and Salvage Network			
Number of STSSN staff hired and operational		X	
Inventory of start-up equipment purchased		X	X
Number of necropsies completed			X
Number of training programs provided			X
Enhancement of the Sea Turtle Stranding and Salvage Network and Rehabilitation Efforts in Texas			
Restoration funding		X	

[10] Pre-project monitoring may not be identified in all cases. In some cases, the project may be initiating a new program or activity for which no historical information is available. In other cases, insufficient historical data may exist or existing historical data may not be appropriate to compare to project performance monitoring data.

Monitoring Activities	Pre-Project Monitoring[10]	Project Start-up Monitoring	Performance Monitoring Years 1 - 10
agreement			
Level of survey effort			X
Sea turtle response			X
Influential events			X
Documentation of expenditures			X
Development of a Sea Turtle Emergency Response Program			
Number of MASH units built-			
out, staged and ready for use		X	X
Response capacity during cold stun or other emergency events	X		X
Sea turtle condition following response			X

B.11.3 Reporting and Data Requirements

This section describes the process the Implementing Trustees and project partners will follow to document, validate and report field data collected for the purposes of performance monitoring. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data;
- Organize, track, locate, and access monitoring data over the long-term; and
- Share finalized monitoring data with the public in a consistent and comprehensible format.

Reporting

The Implementing Trustees shall provide annual status report describing the status of and any changes to this Early Restoration Project Component and/or project Component expenditures during each calendar year. The Implementing Trustees shall provide annual status reports to the public for all performance objectives until the applicable performance criteria, monitoring, and maintenance period has expired or by the agreed upon stipulations for the sea turtle early restoration project, whichever comes first.

Annual reporting will cover from January 1st to December 31st of each restoration year. The first annual report will cover the calendar year following the year in which the project stipulation is filed. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. Data that is not available within this time-period will be provided within 6 months after the conclusion of the subject annual reporting year. Reported data and all data that is available to the public will be aggregated in accordance applicable laws and regulations. While the Trustees will be relying on data from the existing programs, only aggregated summary data will be incorporated in annual reports.

Data for this Component will be analyzed, in part, by evaluating trends related to sea turtle strandings and rehabilitation that occur during the current monitoring period for this Component in comparison to previous reporting periods for this project. Data will not be compared to historical data in all cases because some data collected as part of this Component is not directly comparable to the existing historical data.

The Implementing Trustees will develop a final project summary at the conclusion of the 10-year project period which will detail the overall accomplishments of the project.

Data Documentation

The majority of data collected for this Component will be reports of sea turtle strandings and surveys conducted by the STSSN, which will be made available to BPXP at the times and in the form set forth in this plan. The Implementing Trustees will be relying on data from the existing programs and only aggregated summary data will be incorporated in annual reports. To the extent possible, all environmental and biological data collected during monitoring activities will be documented using existing standardized report forms and established field protocols, which will be made available to BPXP at the times and in the form set forth in this plan.

Where and when applicable, all tangible forms of data generated by the Implementing Trustees or project partners, will be reviewed by the Implementing Trustees for completeness and accuracy before being finalized. Original hardcopy report forms and other relevant data including photographs will be retained and maintained by the STSSN in a secure location in accordance with agency, program and Deepwater Horizon litigation-hold requirements.

Data Transcription, Verification, and Analysis

Data collected by existing programs is subject to the existing verification procedures of the programs from which the data originate. Data generated by this Component will be reviewed by the appropriate Implementing Trustee (NOAA, DOI and/or Texas Trustees) for completeness and accuracy before being finalized. Originals or copies (to be decided by the Implementing Trustee) of the data collected, which may include but is not limited to datasheets, notebooks, and photographs (which may be in the form of photo micro SD cards) will be retained by the federal or state programs (including project partners) that collected the data and will be stored in a secure location in accordance with agency and applicable litigation hold requirements. Any data that is transferred to the Implementing Trustee(s) by non-state and non-federal project participants will be retained by the Implementing Trustee(s) and stored in a secure location in accordance with agency and applicable litigation-hold requirements. Prior to data collection efforts, the Implementing Trustees will decide where the original documents and copies of those documents will be stored.

When the data transcription and verification/validation processes are complete, electronic datasets can be used for data analysis. Analyses will be conducted by the Implementing Trustees to derive Project monitoring performance criteria metrics.

The provision of data under this plan is not intended to affect the rights of any party to object to the relevance or admissibility of that data in any judicial or administrative proceeding.

B.11.4 References

National Park Service. 2013. Texas Sea Turtle Manual. March 2013.

APPENDIX A: EXAMPLE STSSN REPORTING FORM

Existing reporting form may be modified or supplemented as necessary

SEA TURTLE STRANDING AND SALVAGE NETWORK – STRANDING REPORT

OBSERVER'S NAME / ADDRESS / PHONE:
First _____ M.I. ____ Last _____
Affiliation _____
Address _____
_____
Area code/Phone number _____

STRANDING DATE:
Year 20☐☐ Month ☐☐ Day ☐☐
Turtle number by day ☐☐

Coordinator must be notified within 24 hrs; this was done by ☐*phone* ☐*email* ☐*fax*

SPECIES: (check one)
- ☐ CC = Loggerhead
- ☐ CM = Green
- ☐ DC = Leatherback
- ☐ EI = Hawksbill
- ☐ LK = Kemp's Ridley
- ☐ LO = Olive Ridley
- ☐ UN = Unidentified

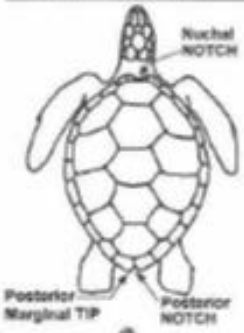
Check Unidentified if not positive. Do Not Guess.

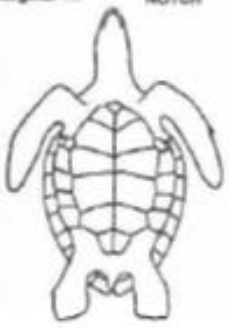
Carcass necropsied? ☐Yes ☐No
Photos taken? ☐Yes ☐No
Species verified by coordinator?
☐ Yes ☐ No

SEX:
- ☐ Undetermined
- ☐ Female ☐ Male

Does tail extend beyond carapace?
- ☐ Yes; how far? _____ cm / in
- ☐ No

How was sex determined?
- ☐ Necropsy
- ☐ Tail length (adult only)





STRANDING LOCATION: ☐Offshore (Atlantic or Gulf beach) ☐Inshore (bay, river, sound, inlet, etc)
State _____ County/Parrish _____
Descriptive location (be specific) _____
_____
_____
Latitude _____ Longitude _____

CONDITION: (check one)
- ☐ 0 = Alive
- ☐ 1 = Fresh dead
- ☐ 2 = Moderately decomposed
- ☐ 3 = Severely decomposed
- ☐ 4 = Dried carcass
- ☐ 5 = Skeleton, bones only

TAGS: ***Contact coordinator before disposing of any tagged animal!!***
Checked for flipper tags? ☐ Yes ☐ No
Check all 4 flippers. If found, record tag number(s) / tag location / return address
_____
_____
_____
PIT tag scan? ☐ Yes ☐ No
If found, record number / tag location
_____
_____
Coded wire tag scan? ☐ Yes ☐ No
If positive response, record location (flipper)
_____
Checked for living tag? ☐Yes ☐ No
If found, record location (scute number & side)
_____

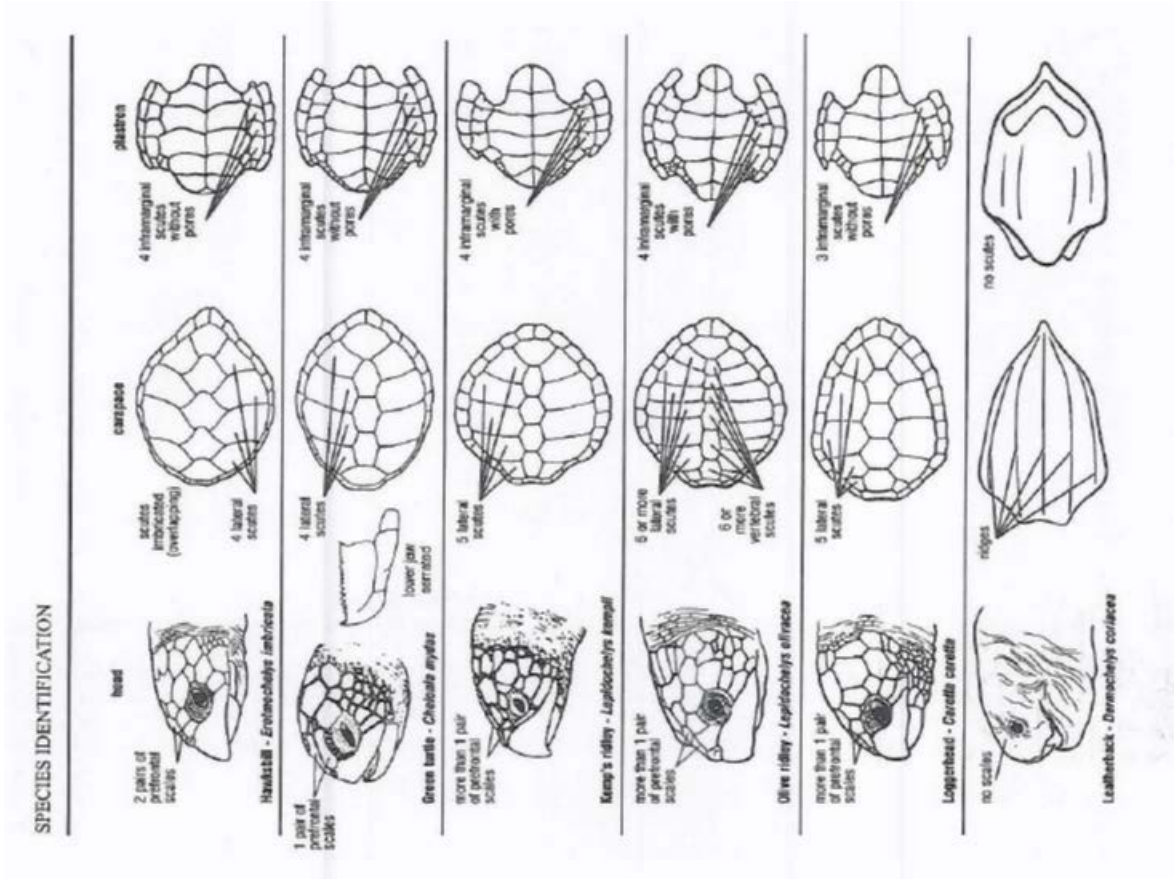
FINAL DISPOSITION: (check)
- ☐1 = Left on beach where found; painted? ☐Yes* ☐No(5)
- ☐2 = Buried: ☐ on beach / ☐ off beach; carcass painted before buried? ☐ Yes* ☐ No
- ☐3 = Salvaged: ☐ all / ☐ part(s), what/why? _____
_____
_____
- ☐4 = Pulled up on beach/dune; painted? ☐Yes* ☐No
- ☐6 = Alive, released
- ☐7 = Alive, taken to rehab. facility, where? _____
_____
- ☐8 = Left floating, not recovered; painted? ☐Yes* ☐No
- ☐9 = Disposition unknown, explain _____
_____

If painted, what color? _____

CARAPACE MEASUREMENTS: (*see drawing*)

Using calipers		**Circle unit**
Straight length (NOTCH-TIP)	_____	cm / in
Minimum length (NOTCH-NOTCH)	_____	cm / in
Straight width (Widest Point)	_____	cm / in
Using non-metal measuring tape		**Circle unit**
Curved length (NOTCH–TIP)	_____	cm / in
Minimum length (NOTCH-NOTCH)	_____	cm / in
Curved width (Widest Point)	_____	cm / in
		Circle unit
Weight ☐ actual / ☐ est.	_____	kg / lb

Mark wounds / abnormalities on diagrams at left and describe below (note tar or oil, gear or debris entanglement, propeller damage, epibiota, papillomas, emaciation, etc.). **Please note if no wounds / abnormalities are found.**
_____
_____
_____
_____
_____
_____



Please use an envelope and mail original form to:

APPROPRIATE STATE STSSN COORDINATOR

A list of these state coordinators can be found at

http://www.sefsc.noaa.gov/seaturtlesSTSSN.jsp

B.12 Sea Turtle Early Restoration Project Component C: Gulf of Mexico Shrimp Trawl Bycatch Reduction

B.12.1 Introduction

This document presents the monitoring plan for the Gulf of Mexico Shrimp Trawl Bycatch Reduction project component of the Sea Turtle Early Restoration Project. This project component is included as a Phase IV *Deepwater Horizon* early restoration project that is intended to contribute to making the environment and public whole for injuries to sea turtles. This Plan describes the monitoring activities that will be conducted to evaluate and document the effectiveness at meeting restoration objectives, including the performance criteria that will apply to determining the success of restoration or need for interim corrective action (15 CFR §990.55(b)(1)(vii)).

This Plan is specific to the Gulf of Mexico Shrimp Trawl Bycatch Reduction project component and should not be generalized beyond this. Other monitoring plans and designs may be appropriate in other contexts. The compilation of data under this Plan will not occur until funding under a filed restoration funding agreement for the Sea Turtle Early Restoration Project (Stipulation) has been received. This Plan will be implemented by NOAA and may be modified over time based on the management needs for the project.

This Plan is intended to apply to the performance monitoring activities included herein. BP Exploration & Production, Inc. ("BPXP") and the Trustees agree that they will include this monitoring plan in the final Project Stipulation for the Sea Turtle Early Restoration Project.

Project Overview

Enhancement of the Gulf of Mexico Shrimp Trawl Bycatch Reduction project component (Component) would enhance two existing NOAA programs, 1) the Gulf of Mexico Gear Monitoring Team, and 2) the Southeast Shrimp Trawl Fisheries Observer Program. This project Component would be implemented for a 10-year period. The goal of this Component is to increase compliance with TED regulations through training, education and outreach programs, and capacity building. Increased compliance with TED regulations contributes to reducing sea turtle mortalities in the Gulf of Mexico.

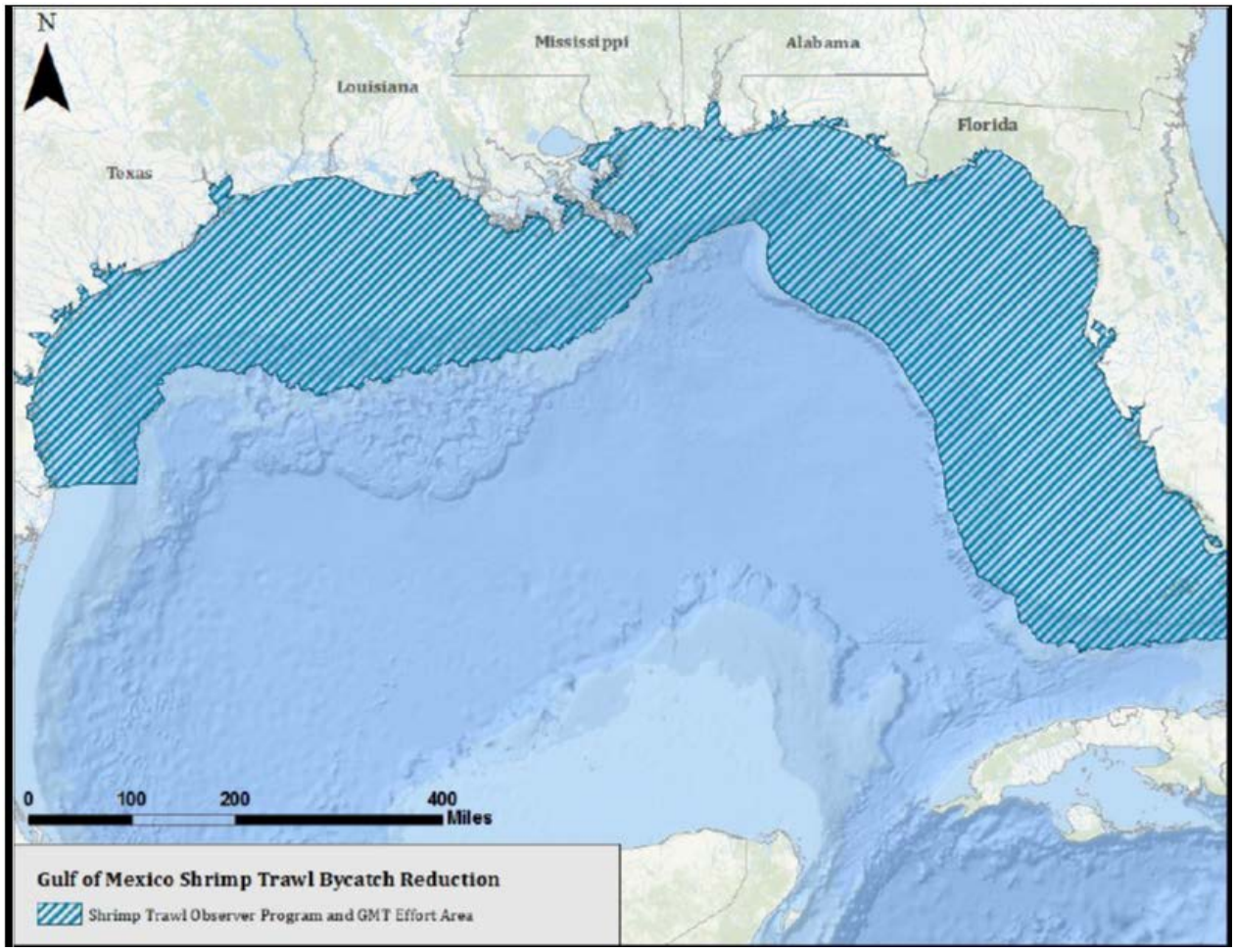
Enhancement of the Gulf of Mexico Gear Monitoring Team (GMT)

The enhanced GMT would provide a greater capacity for education and outreach to the shrimp fishing community to improve compliance with federal TED regulations. The enhanced GMT would provide direct benefits to individual sea turtles by decreasing the likelihood of capture mortality through greater use of properly built, installed, and maintained TEDs.

Enhancement of the Southeast Shrimp Trawl Fisheries Observer Program (Observer Program)

The enhanced Observer Program would improve capacity to collect data on bycatch of sea turtles in the shrimp trawl fishery in the Gulf of Mexico. The funding for this project Component would add 300 observer days annually for a 10-year period. This additional coverage would focus on specific times and areas identified as priorities for monitoring sea turtle bycatch. Information on sea turtle interactions with fishing activities would help target activities of the GMT, thereby contributing to increased compliance and decreased bycatch mortality of sea turtles in the Gulf of Mexico.

Figure B- 25. The project area for the Gulf of Mexico Shrimp Trawl Bycatch Reduction project component



Restoration Objectives and Performance Criteria

The specific restoration objectives relevant for this monitoring plan and the performance criteria used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)) or adaptive management are described below.

Gulf of Mexico Gear Monitoring Team (GMT) Enhancement

Objective 1: Increase training, outreach, and education to add capacity in the shrimp fishery to properly build, install, use, and maintain required TEDs

- Performance Criteria:

At the end of project Year 1, two new teams (four GMT program staff positions) will be hired and operational

At the end of project Year 1, all start-up equipment will be purchased for the two new GMTs

Training, education and outreach efforts and capacity building (i.e., number of net shops/TED manufacturers visited, training programs provided, and courtesy inspections completed) will increase over the pre-project implementation activities, and will be shown in annual report

Objective 2: Improve compliance with TED regulations, including TED maintenance and proper installation

- Performance Criteria:

Compliance rates with existing TED regulations within the Gulf of Mexico state and federal shrimp trawl fisheries are increased

Southeast Shrimp Trawl Fisheries Observer Program Enhancement

Objective 3: Improve NOAA's capability to detect and monitor the bycatch of sea turtles in shrimp trawls

- Performance Criteria:

By the end of project Year 1, an additional 300 observer days per year, targeted for sea turtle information needs, will have been allocated and implemented by the NOAA Gulf of Mexico Shrimp Trawl Fishery Observer Program

300 observer days will be allocated annually for the project lifespan of 10 years

Roles and Responsibilities

NOAA is the implementing Trustee for the Gulf of Mexico Shrimp Trawl Bycatch Reduction project component. The Component field activities will be completed by NOAA's National Marine Fisheries Service (NMFS), Southeast Fisheries Science Center. The Observer Program is operated out of the NOAA NMFS Galveston Lab. The GMT program operates out of the NOAA NMFS Pascagoula Lab. The existing NOAA programs will collect and evaluate data based on the existing procedures for data transfer and validation, and data collected will be further used by NOAA to monitor the project. All data will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information.

NOAA will work with the partners participating in implementation of Component activities and where appropriate to identify corrective actions needed to help achieve success. Corrective actions will be part of an adaptive management process in NOAA will evaluate information obtained as part of this project and other projects or datasets to inform planning of future actions. This allows for flexibility to optimize performance of the bycatch reduction efforts under changing conditions to achieve success.

B.12.2 Project Monitoring

The monitoring for this Component, outlined below, is organized by project objective, with one or more monitoring questions to be addressed by each objective. For the monitoring parameters listed below, information is provided on the monitoring methods, timing and frequency, and sites. Performance criteria are described for parameters that directly evaluate project objectives. Performance criteria are not identified for additional monitoring parameters where data will only be used to inform adaptive management to ensure the success of the project.

NOAA will also evaluate the outcome of annual activities to determine if any changes in monitoring protocols are needed. If changes are needed, NOAA will update this Plan to identify and describe modifications. Any changes to procedures must be compliant with all active agreements.

Performance monitoring will be used to evaluate the effectiveness of the project in meeting the established restoration objectives and assist in determining the need for corrective actions. Additional monitoring may be completed to support project management by identifying potential factors influencing project success. To evaluate the success of this Component, data collected over the 10-year duration will be evaluated in comparison to the project objectives.

Gulf of Mexico Gear Monitoring Team (GMT) Enhancement

<u>Objective 1:</u> Increase training, outreach and educational capacity to build capacity in the shrimp industry about how to properly build, install, use, and maintain required TEDs

Has TED training, outreach and educational capacity been increased?

Parameter #1: Number of teams hired and operational

(a) Method: Track hiring of staff to create two new GMTs focused on TED compliance education and outreach for the shrimp trawl fishery in the Gulf of Mexico

(b) Timing and Frequency: One-time assessment at the end of project Year 1 (included in the Year 1 annual report)

(c) Sites: Gulf-wide

(d) Performance Criterion: At the end of project Year 1, two new teams will be hired and operational

(e) Data Product(s): Report of staff hired and general work schedule (i.e. full-time, part-time, seasonal), including project funds spent on hiring new staff.

Parameter #2: Inventory of start-up equipment purchased

(a) Method: Track all expenditures for start-up equipment for newly hired GMT staff

(b) Timing and Frequency: One-time assessment at the end of project Year 1 (included in the Year 1 annual report)

(c) Sites: Gulf-wide

(d) Performance Criterion:

i. At the end of project Year 1, all start-up equipment will be purchased for the two new GMTs

ii. Equipment maintained, and replacement equipment purchased, for the project lifespan of 10 years

(e) Data Product(s): Inventory of start-up equipment expenditures, and maintenance schedule, summary of annual maintenance, repair and replacement expenditures will be included in the annual report.

Parameter #3: Training, education and outreach activities

(a) Method: Use data sourced from the NOAA GMT program. Data will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information

(b) Timing and Frequency: Annually for the life of the project (included in annual report)

(c) Sites: Gulf-wide

(d) Performance Criterion: Education and outreach efforts (i.e., number of net shops/TED manufacturers visited, training programs provided, and courtesy inspections completed) will increase over the baseline activities, and will be shown in annual report

(e) Data Product(s): Annual summary of education and outreach events. Will be summarized as follows:

Total number of outreach events by state

Detail on what outreach included

Total number of workshops/trainings offered by state

Detail on types of workshops/trainings conducted

Summary of interactions with net shops and TED manufactures, including the outcomes of those interactions.

Objective 2: Improve compliance with TED regulations, including TED maintenance and proper installation ☐

Has compliance with TED regulations increased?

Parameter #1: Compliance with existing TED regulations, including maintenance and installation, within Gulf of Mexico state and federal shrimp trawl fisheries

(a) Method: Use data sourced from the NOAA GMT program and state and federal enforcement offices, as appropriate. Data are compiled by NOAA to determine the number of vessels that are non-compliant and the overall compliance rate for the fishery, which is based in-part on the severity of violation. Data will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information.

(b) Timing and Frequency: Quarterly for the life of the project

(c) Sites: Gulf-wide

(d) Performance Criterion: Compliance rates with existing TED regulations within the shrimp trawl fishery are increased.

(e) Data Product(s): Data will be provided as follows:

- GMT TED inspection data will be aggregated into a GMT Boardings Report to be provided to BPXP on a quarterly basis. The GMT Boardings Report will include the aggregated data broken down by month and geographic area (i.e., statistical reporting zones and depth strata in the GOM), including the number of vessels in compliance with the TED regulations and the number of vessels not in compliance, broken out by violation severity category.

Compliance rates will be provided monthly in a table, as follows:

1. Number of vessels inspected for TED Compliance
2. Number of inspected vessels in violation of TED Regulations
3. Number of inspected vessels that were fully compliant with TED regulations
4. Percentage of vessels that were fully compliant
5. Percentage of vessels that were non-compliant
6. Estimated overall capture rates for juvenile and adult Kemp's ridley sea turtles, and juvenile loggerhead and juvenile green sea turtles.

Southeast Shrimp Trawl Fisheries Observer Program Enhancement

Objective 1: Improve NOAA's capability to detect and monitor the bycatch of sea turtles in shrimp trawls

Has NOAA's capability to detect and monitor sea turtle bycatch in the Gulf of Mexico shrimp trawl fishery increased?

Parameter #1: Number of observer days achieved, including temporal and spatial coverage (i.e., observer days by statistical reporting zones and depth strata in the GOM)

(a) Method: Use data sourced from NOAA's Gulf of Mexico Shrimp Trawl Fishery Observer Program.

(b) Timing and Frequency:

Once at start of project: Review of historical data to direct the initial placement of the observer days within the Gulf of Mexico

Annually for the life of the project

(c) Sites: Gulf-wide

(d) Performance Criteria:

i. By the end of project Year 1, an additional 300 observer days, targeted for sea turtle information needs, will have been allocated and implemented by the NOAA Gulf of Mexico Shrimp Trawl Fishery Observer Program

ii. 300 observer days will be allocated annually for the project lifespan of 10 years

(e) Data Product(s): Aggregated NOAA Gulf of Mexico Shrimp Trawl Fishery Observer Program data will be provided quarterly for the life of the project. Data will be summarized as follows:

Number of trips observed and observer sea days each month by shrimp statistical zone

Parameter #2: Number of bycaught turtles observed during increased observer coverage (i.e. 300 observer days)

(a) Method: Use data sourced from NOAA's Gulf of Mexico Shrimp Trawl Fishery Observer Program

(b) Timing and Frequency: Annually for the life of the project

(c) Sites: Gulf-wide

(d) Performance Criteria: N/A

(e) Data Product(s): The Implementing Trustee will provide the completed Sea Turtle Life History Forms to BPXP unless such production is prohibited under the Magnuson Stevens Act, and in that case the Implementing Trustee shall redact legally protected information from the form, and provide the redacted forms. If production of redacted Sea Turtle Life History Forms is prohibited, the Implementing Trustee will aggregate and provide the data from the completed forms in a summary form on a quarterly basis, with a lag time of one full quarter to complete the summary forms, (i.e., at the end of the 2nd quarter, June 30, a summary report would be provided that includes the data from the field forms completed between January 1 and March 31 of that same year, etc.).

Monitoring Schedule

The schedule for the project monitoring is shown in Table B- 21, separated by monitoring activity. Pre-Project Monitoring refers to obtaining existing historical information. Project Start-up Monitoring refers to all planning and initial activities (i.e. hiring staff, purchasing equipment) that will occur prior to the implementation of field efforts.

Table B- 21. Monitoring Schedule

Monitoring Activity	Pre-Project Monitoring[11]	Project Start-up Monitoring	Performance Monitoring Years 1 - 10
NOAA's GMT			
Number of teams hired and operational		X	
Amount of start-up equipment purchased		X	X
Number of education and outreach activities (i.e., number of net shops/TED manufacturers visited, training programs provided, and courtesy inspections completed)	X		X
Compliance rates with existing TED regulations, including maintenance and installation, within Gulf of Mexico state and federal shrimp trawl fisheries	X		X
Observer Program			
Number of observer days achieved, including temporal and spatial coverage (i.e., observer days by shrimp statistical zone)	X	X	X
Number of incidental takes observed during increased observer coverage			X

B.12.3 Reporting and Data Requirements

[11] Pre-project monitoring may not be identified in all cases. In some cases, the project may be initiating a new program or activity for which no historical information is available. In other cases, insufficient historical data may exist or existing historical data may not be appropriate to compare to project performance monitoring data.

This section describes the process the NOAA will follow to document, validate and report field data collected for the purposes of performance monitoring. The reporting and data requirements described herein are intended to:

Maximize the quality, utility, and integrity of monitoring data;

Organize, track, locate, and access monitoring data over the long-term; and

Share finalized monitoring data with the public in a consistent and comprehensible format.

Reporting

NOAA shall provide annual status reports describing the status of and any changes to this Component's expenditures during each calendar year. NOAA shall provide annual status reports to the public for all performance objectives until the applicable performance criteria, monitoring, and maintenance period has expired or by the agreed upon stipulations for the sea turtle early restoration project, whichever comes first.

Annual reporting will cover from January 1st to December 31st of each restoration year. The first annual report will cover the calendar year following the year in which the project stipulation is filed. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. Data that is not available within this time-period will be provided within 6 months after the conclusion of the subject annual reporting year. Reported data and all data that is available to the public will be aggregated in accordance applicable laws and regulations.

The goal of the shrimp trawl bycatch reduction project component is to reduce sea turtle mortalities in the shrimp trawl fishery by increasing shrimp fisher compliance with federal TED regulations. Three categories of data (STSSN data, Observer Program data, and GMT data) will be used collaboratively to work towards the project goal. Data from each of these three programs will be used in real time to help inform the other programs. Data for this Component will be analyzed, in part, by evaluating trends related to STSSN data, Observer Program data and GMT data during the monitoring period for this Component. Data will not be compared to historical data in all cases because some data collected as part of this Component is not directly comparable to the existing historical data.

While NOAA will be relying on data from the existing programs, due to restrictions on the release of data under the Magnuson-Stevens Fishery Conservation and Management Act, only aggregated summary data will be incorporated in annual reports. In addition to annual reports, NOAA will develop a final project summary at the conclusion of the 10-year project period which will detail the overall accomplishments of the project.

Data Documentation

The majority of data collected for this Component will be inspection reports and observer data collected by NOAA's GMT and Observer Programs, which will be made available to BPXP as described above. To the extent possible, all data generated during monitoring activities will be documented using an existing report form and established protocols (NMFS 2010).

Where and when applicable, all tangible forms of data generated by existing programs, will be reviewed by NOAA for completeness and accuracy before being finalized. Original hardcopy report forms and other relevant data including photographs will be retained and maintained by the existing programs in a secure location in accordance with agency, program and Deepwater Horizon litigation-hold requirements.

Data Transcription, Verification, and Analysis

Data collected by existing programs, including NOAA's GMT and Observer Programs, and data from other outside resources, is subject to the existing verification procedures of the programs from which the data originate.

Data generated by this project component will be reviewed by NOAA for completeness and accuracy before being finalized. Originals or copies (to be decided by the NOAA) of the data collected, which may include but is not limited to datasheets, notebooks, and photographs (which may be in the form of photo micro SD cards) will be retained by the federal or state programs that collected the data and stored in a secure location in accordance with agency and applicable litigation-hold requirements. Any data that are transferred to the implementing Trustees by non-state and non-federal project participants will be retained NOAA and stored in a secure location in accordance with agency and applicable litigation-hold requirements. Prior to data collection efforts, NOAA will decide where the original documents and copies of those documents will be stored.

When the data transcription and verification/validation processes are complete, electronic datasets can be used for data analysis. Analyses will be conducted NOAA to derive Project monitoring performance criteria metrics.

The provision of data under this plan is not intended to affect the rights of any party to object to the relevance or admissibility of that data in any judicial or administrative proceeding.

B.12.4 References

NMFS. 2010. Characterization of the US Gulf of Mexico and Southeastern Atlantic Otter Trawl and Bottom Reef Fish Fisheries Observer Training Manual. National Marine Fisheries Service, Southeast Fisheries Science Center, Galveston Laboratory. https://www.st.nmfs.noaa.gov/Assets/Observer-Program/pdf/Shrimp_Reef_fish_Manual_9_22_10.pdf

B.13 Sea Turtle Early Restoration Project Component D: Texas Enhanced Fisheries Bycatch Enforcement

B.13.1 Introduction

This document presents the monitoring plan (Plan) for the Texas Enhanced Fisheries Bycatch Enforcement, which is a component of the Sea Turtle Early Restoration Project. This project component is included as part of a Phase IV *Deepwater Horizon* early restoration project and is intended to contribute to making the environment and public whole for injuries to sea turtles. This plan describes the activities that will be conducted to evaluate and document its effectiveness at meeting its restoration objectives, including the performance criteria that will apply to determining the success of restoration or need for interim corrective action (15 CFR §990.55(b)(1)(vii)).

This Plan is specific to the Texas Enhanced Fisheries Bycatch Enforcement Component (Component) and should not be generalized beyond this component. Other monitoring plans and designs may be appropriate in other contexts or sites. This Plan will be implemented by the Texas Trustees[12], in cooperation with the project partner, Texas Parks and Wildlife Department (TPWD) Law Enforcement Division. This Plan may be modified over time based on the management needs for this project component.

This Plan is intended to apply to the performance monitoring activities included herein. BP Exploration & Production, Inc. ("BPXP") and the Trustees agree that they will include this monitoring plan in the final Project Stipulation for the Sea Turtle Early Restoration Project.

Project Overview

The Texas Enhanced Fisheries Bycatch Enforcement Component would enhance TPWD enforcement activities for fisheries that incidentally catch sea turtles while they operate primarily in Texas State waters (approximately 367 miles of coast line out to 9 nautical miles) within the Gulf of Mexico for a 10- year period (Figure B- 26). These increased enforcement operations would focus on compliance with Turtle Excluder Device (TED) regulations during the Gulf shrimp fishery season (primarily February through mid-May) right before the Gulf closes to shrimping in May. Patrols would be targeted during this timeframe because it is an active time not only for the industry, but for sea turtle interactions due to the beginning of the

[12] The Texas Trustees include the Texas Commission on Environmental Quality, Texas General Land Office, and Texas Parks and Wildlife Department (TPWD).

spring nesting season. Previous efforts to increase enforcement activities during this time period have had an impact on compliance rates, reducing the number of observed strandings during this time period. The goal of this project component is to reduce sea turtle mortalities through increased compliance with TED regulations as a result of increased enforcement actions.

Figure B- 26. Texas Enhanced Fisheries Bycatch Enforcement geographic scope



Restoration Objectives and Performance Criteria

The specific restoration objectives for the Texas Enhanced Fisheries Bycatch Enforcement Component that are relevant for this monitoring plan and the performance criteria used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)) or adaptive management are:

Objective #1: Increase enforcement activities related to the proper use of TEDs.

Performance Criteria

- Each year there will be an increase in TED-related enforcement vessel patrol hours as compared to the currently funded vessel patrol hours.
- By the end of the monitoring period, there will be a decrease in the number of enforcement actions as compared to the number of boat inspections.

Objective #2: Increase compliance with TED regulations.

Performance Criteria:

- By the end of the monitoring period, there will be a decrease in number of violations or severity of violations as compared to historic data.

Roles and Responsibilities

This Plan will be implemented by the Texas Trustees via the project partner, TPWD law enforcement division. TPWD will conduct all enforcement-related activities and provide the Texas Trustees information that documents their actions.

The Texas Trustees will work with the TPWD Law Enforcement Division to identify corrective actions needed to help achieve success, measured as a decrease in the number or severity of violations. Corrective actions will be part of an adaptive management process in which the Texas Trustees and TPWD law enforcement may evaluate information obtained as part of this project and other projects or datasets to inform future actions. This allows for flexibility to maximize performance for this project component under changing conditions.

B.13.2 Project Monitoring

The proposed monitoring for this project component, outlined below, is organized by objective, with one or more monitoring parameters. For each of the identified monitoring parameters, where appropriate, information is provided on the monitoring methods, timing and frequency, and sites. The Implementing Trustees will also evaluate the outcome of each year's activities to determine if any changes in monitoring

protocols are needed. If changes are needed, the Trustees will update the Project Monitoring Plan to describe any modifications.

The activities involved with monitoring each objective are detailed below:

Objective #1: Increase enforcement patrols for the proper use of TEDs.

- Have the number of hours spent on TED-related enforcement patrols increased?

Parameter #1: Documentation of restoration funding agreements between the Texas Trustees and the TPWD law enforcement division.

a) Method: Signed agreement. This agreement will include information on the techniques, timing and frequency, reporting requirements, and the type of data that will be collected and submitted.

b) Timing and Frequency: Prior to distribution of funds from Texas Trustees to TPWD law enforcement.

c) Performance Criteria: Compliance with terms of the active agreement between the Texas Trustees and TPWD law enforcement.

d) **Data Product(s):** TPWD Signed Agreements, and any documentation of non-compliance with the terms of the agreement between Texas Trustees and the TPWD over the life of the project.

Parameter #2: Level of effort for enforcement will include vessel patrol hours, personnel hours used for TED-related enforcement activities, boat hours and number of vessels inspected.

(a) **Method: Historical and new data will be collected from TPWD law enforcement. Data collection will be provided to the Texas Trustees. Texas Trustees will analyze the data provided by TPWD law enforcement.**

(b) **Timing and Frequency:**

(i) ***One time, in the first annual report, historical data will be compiled as part of pre-project implementation monitoring (once)***

(ii) ***On an annual basis for the duration of the project, the data products collected from this project that are related to this parameter will be reported.***

(c) **Sites: Gulf of Mexico, primarily Texas state waters.**

(d) **Performance Criteria:**

(i) ***Each year there will be an increase in TED-related enforcement vessel patrol hours as compared to the currently funded vessel patrol hours.***

(ii) ***By the end of the monitoring period, there will be a decrease in the number of enforcement actions as compared to the number of boat inspections.***

(e) **Data Product(s): vessel patrol hours, personnel hours used for TED-related enforcement activities, boat hours and number of vessels inspected. Geographical data associated with inspections (waterbody and county).**

Objective #2: Increase compliance with TED regulations.

- Has compliance with TED regulations increased?

Parameter #1: Compliance with TED regulations which will include the number and severity of citations.

(a) **Method: Historical information on the number and severity of citations related to noncompliance with TED regulations will be obtained from TPWD for at least the 5 years prior to project implementation. TPWD will monitor compliance with TED regulations following regular enforcement duties and procedures and provide information relating to citations including number and severity of citation during the period of funding. Data regarding the number of citations an individual receives will be aggregated, as required by law.**

(b) **Timing and Frequency:**

(i) ***One time, in the first annual report, historical data will be compiled.***

(ii) ***On an annual basis for the duration of the project, the data products collected from this project that are related to this parameter will be reported Sites: Gulf of Mexico, primarily Texas state waters.***

(c) **Performance Criteria: By the end of the monitoring period, there will be a decrease in number of violations or severity of violations as compared to historic data.**

(d) **Data Product (s): Aggregate reports containing the number and severity of citations broken out by geographical region (waterbody location and county). These reports will be provided on a quarterly basis, with a lag time of one full quarter to complete the reports, (i.e., at the end of the 2nd quarter, June 30, a report will be provided that includes the data collected between January 1 and March 31 of that same year, etc.).**

Monitoring Schedule

The schedule for this project component monitoring is shown in Table B- 22, separated by monitoring activity. The compilation of historical data identified in this plan will be reported in the first annual

report (Pre-Project Monitoring). Performance Monitoring will begin at the point agreements are in place between the Texas Trustees and TPWD law enforcement.

Table B- 22. Monitoring Schedule

Monitoring Activity	Pre-Project Monitoring	Project Start-up Monitoring	Performance Monitoring Years 1-10
Documentation of restoration funding agreement		X	X
Level of enforcement effort	X		X
Compliance with TED regulations	X		X

B.13.3 Reporting and Data Requirements

This section describes the process the Texas Trustees and TPWD will follow to document, validate and report field data collected for the purposes of Performance Monitoring. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data;
- Organize, track, locate, and access monitoring data over the long-term; and
- Share finalized monitoring data with the public in a consistent and comprehensible format.

Reporting

The Texas Trustees shall provide annual status reports describing the status of and any changes to this Early Restoration Project Component and/or project Component expenditures during each calendar year. The Texas Trustees shall provide annual status reports to the public until the applicable performance criteria, monitoring, and maintenance period has expired or the annual reporting requirement has been met in any active agreement, whichever comes first.

Annual reporting will cover from January 1st to December 31st of each restoration year. The first annual report will cover the calendar year following the year in which the Stipulation is filed. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year.

Data that is not available within this time-period will be provided within 6 months after the conclusion of the subject annual reporting year. Reported data and all data that is available to the public will be aggregated in accordance with applicable laws and regulations. While the Trustees will be relying on data from the existing programs, only aggregated summary data will be incorporated in annual reports. The Implementing Trustees will develop a final project summary at the conclusion of the 10-year project period which will detail the overall accomplishments of the project. Data collected as part of this project will be compared to historical data. Additionally, there will be an evaluation of any changes in the citations (number or severity) over time.

Data Documentation

Data collected for this Component will be provided to BPXP at the times set forth in paragraphs 2, 3 and 4.1 herein. To the extent possible, data generated during monitoring activities will be documented in accordance with methods and procedures used by the TPWD Law Enforcement Division. Data will be entered into a law enforcement managed database and appropriate fields will be reported out.

Data Transcription, Validation, and Analysis

Data collected by TPWD law enforcement is subject to existing verification procedures of its Law Enforcement Division. Data generated by this project component will be reviewed by the Texas Trustees for completeness and accuracy before being finalized. Monitoring data that is transferred to the Texas Trustees will be retained by the Texas Trustees and stored in accordance with TPWD, Trustee, and applicable litigation-hold requirements.

When the data transcription and verification/validation processes are complete, electronic datasets can be used for data analysis. Analyses will be used to derive Project monitoring performance criteria metrics.

The provision of data under this plan is not intended to affect the rights of any party to object to the relevance or admissibility of that data in any judicial or administrative proceeding.

B.14 Pelagic Longline Bycatch Reduction Project

B.14.1 Introduction

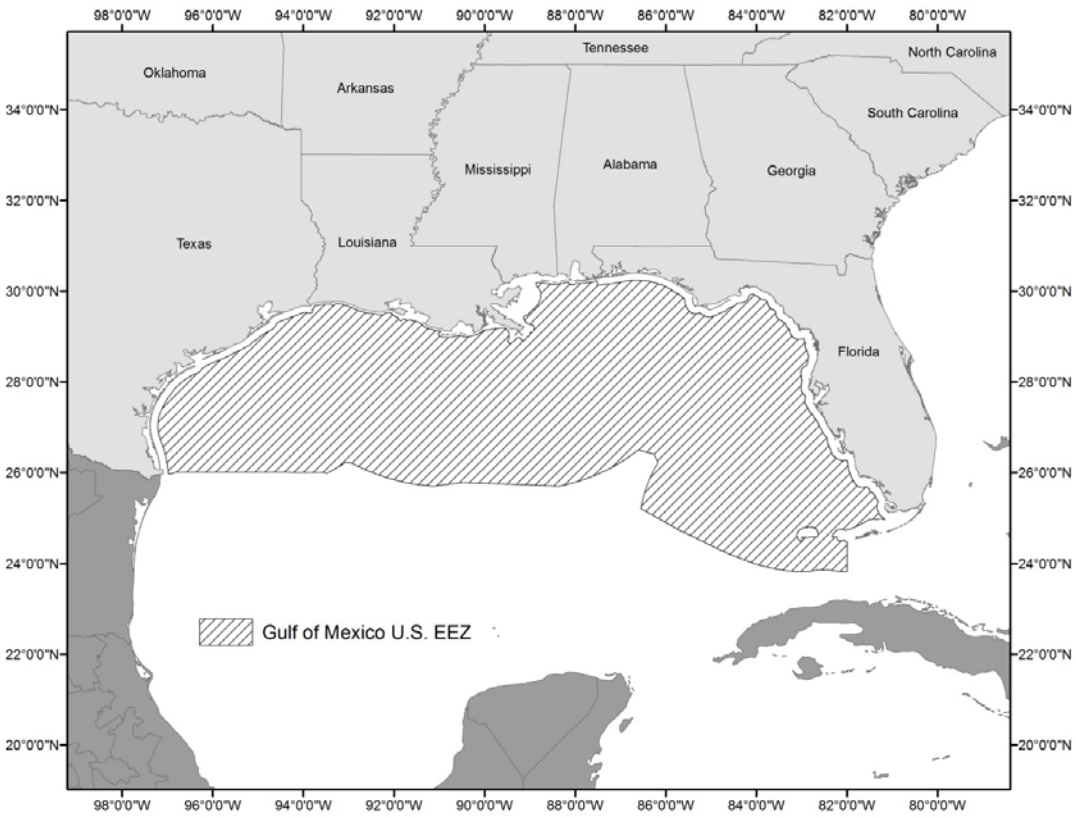
This document presents a monitoring plan designed to monitor and evaluate the performance of the proposed Pelagic Longline Bycatch Reduction Project (hereafter proposed PLL Project). The PLL Project is proposed in phase IV of early restoration under the Deepwater Horizon Oil Spill Early Restoration Framework Agreement[13] to offset injuries to pelagic finfish, marine mammals, and leatherback turtles. This monitoring plan is specific to this early restoration project and should not be generalized beyond this project. Other monitoring plans and designs may be appropriate in other contexts or projects.

B.14.1.1 Project Overview

The proposed PLL Project for Early Restoration targets the pelagic longline fishery in the waters of the US EEZ of the Gulf of Mexico (hereafter GOM PLL fishery) (Figure B- 27), and is open to pelagic longline vessels with sufficient available Individual Bluefin Quota for the GOM PLL fishery.

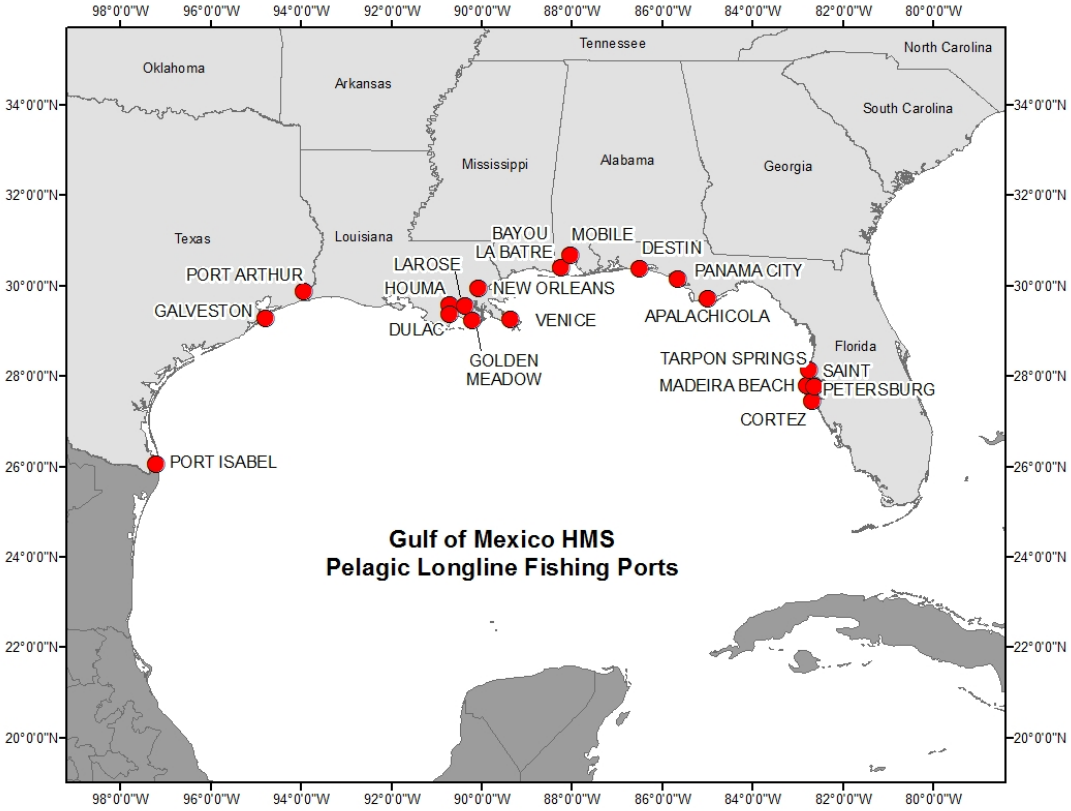
[13] http://www.restorethegulf.gov/sites/default/files/documents/pdf/framework-for-early-restoration-04212011.pdf

Figure B- 27. Proposed PLL Project location in the US Exclusive Economic Zone in the Gulf of Mexico indicated by shaded area



The project is intended to restore biomass of offshore fishes by reducing discards in the GOM PLL fishery, while minimizing economic effects from reductions of catches of target species through the distribution of and training in use of alternative gears. A map of Highly Migratory Species (HMS) PLL fishing ports in the US Gulf of Mexico, the proposed PLL Project's target ports, is provided in Figure B-28.

Figure B- 28. Highly Migratory Species (HMS) Pelagic Longline Fishing Ports in the Gulf of Mexico from 2006 – 2012. Data Source: HMS Logbooks



The following project elements are important to effectiveness:

- Vessel participation for the duration of the project (*i.e.* time to reach 60 vessel-year participation in repose)
- Conversion to alternative gears, including installation and training

B.14.1.2 Restoration Objectives and Performance Criteria

The goal of the proposed PLL Project is to restore biomass of offshore fishes through a reduction in bycatch mortality in the GOM PLL fishery and to minimize economic effects from potential reductions of catches of target species. Restoration objectives to be evaluated through monitoring are: 1) Reduce discards in the GOM PLL fishery 2) Minimize economic effects from potential reductions of catches of target species through the use of alternative gears in the Gulf of Mexico. Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). Performance criteria will represent interim milestones that help project managers determine if the project is performing at an acceptable level given the current stage of the project. The performance

criteria for this proposed project are identified by objective below and shown over several phases[14] in Table B- 23. These may be set or adjusted to reflect, or for consistency with, the project's final design, implementation details or requirements.

1) Reduce discards in the GOM PLL fishery
    a. Performance Criteria:
        i. Annual target number of executed agreements for participation in repose is reached (number to be set before the first repose period begins)
        ii. Annual target participation[15] in repose is reached
        iii. 60-vessel year participation in repose is achieved
        iv. Participants are in compliance with terms of active agreements
        v. Average biomass of dead discards avoided averages 11,600 dkg per vessel year

2) Minimize economic effects from potential reductions of catches of target species through the use of alternative gears in the Gulf of Mexico
    b. Performance Criteria:
        i. Annual target number of executed agreements[15] for participation in gear conversion is reached (number to be set before the first repose period begins)
        ii. Annual target level of participation[15] in gear conversion is reached
        iii. Vessels participating in the gear conversion have installed and are using their alternative gears as defined in their agreement
        iv. Net profit[15] of alternative gears will improve annually

[14] For a full description of monitoring phases, see section 3 Monitoring Schedule

[15] Target participation and net profit will be updated prior to implementation of the first repose period

Table B- 23. Performance criteria by restoration objective for the Proposed PLL Project

Performance Criteria	Project Execution	Post-Execution	Project End
OBJECTIVE 1 – Reduce Discards in the GOM PLL fishery			
Participation in annual repose periods	• Annual target number of executed agreements[15] for participation in repose is reached	• Annual target participation[15] in repose is achieved • Participants are in compliance with terms of active agreements	• 60-vessel year participation in repose is achieved
Quantity and disposition of bycatch and discards by species		• Average biomass of dead discards avoided averages 11,600 dkg per vessel year	• Average biomass of dead discards avoided averages 11,600 dkg per vessel year
OBJECTIVE 2 – Minimize Economic Effects through Use of Alternative Gears			
Participation in Alternative gear installation and use	• Annual target number of executed agreements[15] for participation in gear conversion is reached	• Annual target level of participation[15] in gear conversion is reached • Vessels participating in the gear conversion have installed and are using their alternative gears as defined in their agreement	• Target level of participation[15] in gear conversion is reached
Net profit of alternative gears (catch per unit effort)		• Net profit[15] of alternative gears will improve annually	• Net profit[15] of alternative gears will improve annually has improved

B.14.1.3 Conceptual Model and Monitoring Questions

Table B- 24 below outlines the conceptual model that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

Table B- 24. Conceptual model for the Pelagic Longline Bycatch Reduction Project

Activity	Output	Short-term outcome	Long-term outcome
• Fishing repose	• Agreements signed that cover a 60 vessel-year participation in repose	• Target participation is reached • Reduced bycatch	• Target participation is sustained • Reduced bycatch
• Conversion of PLL gear to alternative gears	• Provisioning of alternative gears to participants • Education and training on alternate gears • Utilization of alternative gears • Evaluation of alternative gears • Technical extension to gear users to improve efficiency	• Target participation is reached • Improved net profit of alternative gears	• Target participation is sustained • Improved net profit of alternative gears • Effective alternative gear technology is transferred to new areas

This monitoring plan has been designed to address the following monitoring questions for each component objective and desired outcome:

Objective #1: Reduce discards in the GOM PLL fishery

- Are vessel owners fulfilling their agreement to abstain from PLL fishing during the agreement period(s)?
- What is the quantity and disposition of bycatch species in the Gulf of Mexico?
- What gear configurations, set parameters, and environmental parameters result in reduced bycatch using alternative gears?
- What is the dead discard rate when using alternative gears or PLL gear in the Gulf of Mexico?
- What is the dead:live discard ratio, when using alternative gears or PLL gear in the Gulf of Mexico?
- Does post-release survival of bycatch species increase when caught with alternative gears, compared to being caught with PLL gear?

Objective #2: Minimize economic effects from potential reductions of catches of target species through the use of alternative gears in the Gulf of Mexico

- Are vessel owners using alternative gears to the level prescribed in their agreement?
- What are the annual income, annual expenses, and net profit per vessel using alternative gears?
- What gear configurations, set parameters, environmental parameters, could result in increased economic efficiency of alternative gears (*e.g.* higher catch rates, higher product quality, reduced costs)?
- Is effective alternative gear technology being transferred to users?
- Are market conditions changing such that they are influencing net profit?

B.14.2 Project Monitoring

Performance monitoring is required by OPA to evaluate the effectiveness of the project in meeting its established restoration objectives and to assist in determining the need for corrective actions. Additional monitoring may be done to support project management by informing corrective actions and identifying potential factors influencing project success.

The monitoring for this restoration project, outlined below, includes both performance and potential additional monitoring and is organized by restoration objective, with one or more monitoring parameters for each objective. For each of the monitoring parameters, information is provided on the monitoring methods, timing and frequency, and sample size. In addition, performance criteria for each parameter are identified (if applicable).

Performance Monitoring to evaluate project effectiveness and inform the need for corrective actions:

Objective #1: Reduce discards in the GOM PLL fishery

- Are vessel owners fulfilling their agreement to abstain from PLL fishing during the agreement period?
- What is the quantity and disposition of bycatch species in the Gulf of Mexico?
- What gear configurations, set parameters, and environmental parameters result in reduced bycatch using alternative gears?

  Parameter #1: Number of agreements fully executed, including number of participating vessels in repose

  a) Method: Relate agreements with participating vessels to track the number of vessels signed up to participate in the repose
  b) Timing and Frequency: Report data annually from PLL Project implementation through the duration of the project
  c) Sample Size: Track all agreements

d) Performance Criteria:
    i. Annual target number of executed agreements [15] for participation in repose is reached (target number to be set before the first repose period begins)
    ii. Annual target participation [15] in repose is reached during project implementation
    iii. 60-vessel year participation in repose is achieved at the end of the project

Parameter #2: Counts of non-compliance with agreements by all vessels participating in the repose

a) Method: Reference agreements with participants to identify and count any vessels not complying with their agreements
b) Timing and Frequency: Collate data annually from PLL Project implementation through the duration of the project
c) Sample Size: Track agreements of all vessels participating in the Project
d) Performance Criterion: Participants are in compliance with terms of active agreements

Parameter Set #3: Quantity (count by size) and disposition of bycatch and discards by species caught by project participant vessels with alternative gear and vessels in the PLL fishery

a) Method: Compile data sourced from Atlantic HMS Logbooks, the PLL Project vessel observers, the existing Pelagic Observer Program (POP), set forms, dealer report forms, weighout slips, payment receipts, and trip tickets. Data will be reported in aggregate to protect privacy and in adherence with law
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all or a subset of project participant vessels using alternative gear; track all vessels in the GOM PLL fishery for which POP data are collected
d) Performance Criterion: Average biomass of dead discards avoided averages 11,600 dkg per vessel year

Parameter Set #4: Gear configuration parameters (*e.g.* gear type used, gear condition, specific gear parameters (*e.g.* number/depth of hooks, floats, light sticks, radio beacons, etc.), for project participant vessels with alternative gear and vessels in the GOM PLL fishery

a) Method: Compile data sourced from PLL Project vessel observers, and the existing Pelagic Observer Program, Atlantic HMS Logbooks, and trip tickets
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all or a subset of participating vessels using alternative gear; track all vessels in the GOM PLL fishery

Parameter Set #5: Set parameters (*e.g.* set location, target species, date, time of day, speed, days at sea, etc.) for vessels in the GOM PLL fishery

a) Method: Compile data sourced from Atlantic HMS Logbooks, PLL Project vessel observers, the existing Pelagic Observer Program, set forms and trip tickets
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all vessels in the GOM PLL fishery

Objective #2: Minimize economic effects from potential reductions of catches of target species through the use of alternative gears in the Gulf of Mexico

- Are vessel owners using alternative gears to the level prescribed in their agreement?
- What are the annual income, annual expenses, and net profit using alternative gears?
- What gear configurations, set parameters, environmental parameters, could result in increased economic efficiency of alternative gears (*e.g.* higher catch rates, higher product quality, reduced costs)?

  Parameter #1: Number of repose agreements that include participation in the alternative gear use project component

  a) Method: Reference agreements with participants to track the number of vessels signed up to participate in the repose and conversion to alternative gears
  b) Timing and Frequency: Report data annually from PLL Project implementation through the duration of the project
  c) Sample Size: Track all agreements
  d) Performance Criteria:
     i. Annual target number of executed agreements[15] for participation in gear conversion is reached (number to be set before the first repose period begins)
     ii. Annual target level of participation[15] in gear conversion is reached

  Parameter #2: Current status of installation, use, and training on use of alternative gears on project participant vessels

  a) Method: Reference agreements with participants, interim and annual reports from contractors and consultants regarding gear installation and training on use of gear. Track the number of vessels receiving alternative gears, the type of gear and the status (installation and use) of alternative gears
  b) Timing and Frequency: Report data annually from PLL Project implementation through the duration of the project
  c) Sample Size: Track status of alternative gear for all vessels participating in gear conversion
  d) Performance Criterion: Vessels participating in the gear conversion have installed and are using their alternative gears as defined in their agreement

Parameter Set #3: Quantity (count by weight, size, and product grade), and price of landings of fishery target species landed by project participant vessels with alternative gears and vessels in the GOM PLL fishery

a) Method: Compile data sourced from Atlantic HMS Logbooks[16] (part of the NOAA Fisheries Logbook System[17]), the PLL Project vessel observers, the existing Pelagic Observer Program[18], set forms, dealer report forms, weighout slips, payment receipts, trip tickets, trip expense summaries and annual expense reports. Data will be reported in aggregate to protect privacy and in adherence with law
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all project participant vessels using alternative gears; track all vessels in the GOM PLL fishery for which these parameters are collected
d) Performance Criterion (for parameter sets 3 and 4, in combination): Net profit[14] of alternative gears will improve annually

Parameter Set #4: Annual expenses per vessel; (*e.g.* equipment purchases and/or maintenance, staff and salaries, revenue sharing, fuel and trip costs), for project participant vessels with alternative gears and vessels in the GOM PLL fishery

a) Method: Compile data sourced from Atlantic HMS Logbooks, the PLL Project vessel observers, the existing Pelagic Observer Program, set forms, dealer report forms, weighout slips, payment receipts, trip tickets, trip expense summaries and annual expense reports. Data will be reported in aggregate to protect privacy and in adherence with law
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all project participant vessels using alternative gears; track all vessels in the GOM PLL fishery for which these parameters are collected

[16] Atlantic HMS Logbooks: http://www.sefsc.noaa.gov/fisheries/reporting.htm

[17] NOAA Fisheries Logbook System: http://www.sefsc.noaa.gov/fisheries/logbook.htm

[18] Pelagic Observer Program: http://www.sefsc.noaa.gov/fisheries/observers/pelagic.htm

d) Performance Criterion (for parameter sets 3 and 4, in combination): Net profit[14] of alternative gears () will improve annually

Parameters Sets # 5 and 6: Gear configuration and set parameters for project participant vessels with alternative gear and vessels in the GOM PLL fishery.

a) Method, Timing and Frequency, and Sample Size match those of Parameter Sets 4 (gear configuration) and 5 (set parameters) found under Objective #1.

Parameter Set #7: Environmental conditions (*e.g.* wind speed and direction, weather, wave height, water and air temperature) encountered by project participant vessels with alternative gears

a) Method: Compile data sourced from Atlantic HMS Logbooks, PLL Project vessel observers. Gather satellite-derived, weather buoy-derived and observer-recorded air and sea surface temperature (SST), weather conditions, and wind speed and direction, wave height
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all participating vessels using alternative gears

Additional Monitoring to support project management:

Objective #1: Reduce discards in the GOM PLL fishery

- What is the dead discard rate when using alternative gears or PLL gear in the Gulf of Mexico?
- What is the dead:live discard ratio, when using alternative gears or PLL gear in the Gulf of Mexico?
- Does post-release survival of bycatch species increase when caught with alternative gears, compared to being caught with PLL gear?

Parameter #1: Dead discard rate by species, caught by project participant vessels with alternative gears and vessels in the GOM PLL fishery

a) Method: Compile data sourced from Atlantic HMS Logbooks, the PLL Project vessel observers, the existing Pelagic Observer Program, set forms, dealer report forms, weighout slips, payment receipts, and trip tickets. Data will be reported in aggregate to protect privacy and in adherence with law
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all or a subset of project participant vessels using alternative gears; track all vessels in the GOM PLL fishery for which POP data are collected

Parameter #2: Dead discard ratio by species, caught by project participant vessels with alternative gears and vessels in the PLL fishery

a) Method: Compile data sourced from Atlantic HMS Logbooks, the PLL Project vessel observers, the existing Pelagic Observer Program, set forms, dealer report forms, weighout slips, payment receipts, and trip tickets. Data will be reported in aggregate to protect privacy and in adherence with law
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project

c) Sample Size: Track all or a subset of project participant vessels using alternative gears; track all vessels in the GOM PLL fishery for which POP data are collected

Parameter #3 (as needed and equipment are available): Post-release survival of satellite-tagged individuals caught with alternative and PLL gear

a) Method: Reference satellite tagging information from the NMFS Billfish Project
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Tag a subset of individual fish caught using alternative gears, as satellite tags are available. Track satellite tagging data that are available for vessels in the GOM PLL fishery

<u>Objective #2: Minimize economic effects from potential reductions of catches of target species through the use of alternative gears in the Gulf of Mexico</u>

- Is the effective alternative gear technology being transferred to new areas?
- Are market conditions changing that influence net profit?

Parameter #1: Technology transfer and cooperative extension of alternative gear technology and application of new information: number of demonstrations, workshops, or 1-on-1 informational or troubleshoot sessions, and number of participants

a) Method: Reference agreements with participants and interim and annual reports from contractors and consultants regarding technology transfer and extension tracking data
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all project participant vessels using alternative gears

Parameter Set #2: Qualitative features of the market influencing the revenue for both project participant vessels with alternative gears and vessels in the PLL fishery

a) Method: Collect data on market conditions from dealer report forms, weighout slips and receipts, and prices for fish markets (whole sale prices), and other sources
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all participating vessels using alternative gears; track vessels in the GOM PLL fishery

B.14.3 Monitoring Schedule

Monitoring will occur in several phases throughout this project, including pre-project monitoring, project execution monitoring, and post-execution monitoring. Pre-project monitoring consists of data collection from vessels in the GOM PLL fishery that occurred before the proposed PLL Project would be implemented. Project execution monitoring will occur after a vessel owner executes a contract, and will consist largely of tracking execution of agreements and provisioning of alternative gears. Post-execution monitoring will occur annually for the lifespan of the Project (*i.e.* the time to reach 60 vessel-years of participation in repose, anticipated at 5-10 years). For the proposed PLL Project, post-execution monitoring consists of the majority of monitoring activities, including performance monitoring that will evaluate the project against its performance criteria and additional monitoring that may be done to support project management.

B.14.4 Reporting and Data Requirements

B.14.4.1 Monitoring Reports

Monitoring reports will summarize the annual monitoring events and document the degree to which the project is attaining success. For the purposes of the monitoring reports, a reporting year will cover from January 1st to December 31st. The first monitoring report will cover the calendar year in which the first repose period has commenced as part of the proposed PLL Project. Monitoring reports will be due within nine months after the conclusion of that monitoring year. Monitoring reports for the PLL Project will rely heavily on existing data collection programs to evaluate project performance relative to baseline conditions. Further, project-specific data collection will be implemented through existing monitoring programs in many cases. The anticipated delivery schedule of monitoring reports is a result of the length of time needed to gather and collate data from various sources, aggregation of data to meet regulatory requirements, and completion of complex analyses on a large volume of data. Table B-25 provides examples of existing data collection programs that will be utilized by the PLL Project as well as project-specific monitoring efforts, collected by the project. The reports should provide a summary of the previous monitoring report (including timelines documenting monitoring procedures), a list or table of performance standards that compares annual monitoring results to each performance criterion, and a summary of any problems encountered and solutions to each or whether corrective actions were necessary.

Table B- 25. Data on which monitoring of this project will rely, listed by their source. Data from existing programs are listed on the left, and data collected by the project are listed on the right

Existing data collection programs (also provide baseline data)	Project-Specific Monitoring Efforts (Project data)
• Atlantic HMS Logbooks • Pelagic Observer Program • Set Forms • Dealer Report Forms • Weighout Slips • Payment Receipts • Trip Tickets • Observer, Satellite-derived and weather buoy-derived environmental data (*e.g.* air and sea-surface temperatures, wind speed and direction, and wave height) • Trip Expense Summaries • Annual Expense Reports • NMFS Billfish Project • Wholesale Prices	• Agreements with participating vessels • Proposed PLL Project vessel observers • Observer -derived environmental data (*e.g.* air and sea-surface temperatures, wind speed and direction, and wave height) • Interim and annual reports on gear fate from contractors and consultants

B.14.4.2 Quality Assurance / Quality Control Procedures

(1) Data Collected by Existing Programs

Data this project will rely on that is collected by currently existing programs, including Atlantic HMS Logbooks, Pelagic Observer Program, and all other outside resources, is subject to the QA/QC requirements of the programs from which the data originate (for a comparison of data source, including data from existing programs and project-specific monitoring efforts collected by this project, see Table B- 25).

(2) Data Collected by the Trustees

Data collected by the trustees includes counts of participant vessels referenced from cooperative agreements, status of alternative gears from interim and annual reports from contractors and consultants, and all data from project participant vessel observers, including gear, set, environmental and other parameters.

This section describes the process the National Oceanic and Atmospheric Administration will follow to document, validate and report data collected by the trustees for the purposes of monitoring the project. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data
- Organize, track, locate, and access monitoring data over the long-term

- Share finalized monitoring data with the public in a consistent and comprehensible format

B.14.4.3 Data Documentation

The majority of data collected during this Project will be field observations of environmental conditions and enumeration and size assessment of biological organisms. To the extent possible, all environmental and biological data generated during monitoring activities will be documented using standardized datasheets. If standardized datasheets are unavailable or not readily amendable to record Project-specific data, then Project-specific datasheets will be drafted prior to conducting any Project monitoring activities.

All tangible forms of data will be reviewed by NOAA for completeness and accuracy before being finalized.

B.14.4.4 Data Transcription, Validation, and Analysis

All datasheets and notebook entries will be scanned to PDF files and will be archived along with the hardcopy datasheets.

Relevant Project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into a digital format for required data analysis by NOAA staff or contractors hired by NOAA.

Procedures for data collection (*e.g.* standardized data sheets, metrics, etc.) and quality control / quality assurance for data collected by the PLL Project vessel observers will match procedures of the existing Pelagic Observer Project (POP) to the extent practicable. Additionally, QA/QC standards set by the Trustees' Program Implementation Group will define procedures for all project-specific data.

When the data transcription and QA/QC processes are complete, electronic datasets can be used for data analysis. Analyses will be conducted by NOAA and/or contractors hired by NOAA to derive Project monitoring performance criteria metrics.

Appendix C: Additional Proposed Phase IV Project Offset Information

C.1 Glossary of Terms..... 1

Attachment A. List of Species Associated with Each Species Categorization Grouping 4

This Appendix consists of a glossary of terms utilized for Offsets, applicable solely to the following proposed Phase IV early restoration projects:

- Restoring Living Shorelines and Reefs in Mississippi Estuaries;
- Shell Belt and Coden Belt Roads Living Shoreline Project; and
- Point aux Pins Living Shoreline Project

These definitions are not considered to be a comprehensive list for all Early Restoration Projects under the Framework for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill executed April 20, 2011. Future projects may require other definitions, including but not limited to, other definitions for habitats included in this list.

C.1 Glossary of Terms

Continental Shelf shall mean the contiguous shallow platforms or terraces that surround most of the continents and are terminated seaward by a relatively sharp break in slope, called the shelf edge or shelf break. In the Gulf of Mexico, this generally follows the 200-meter isobaths.

Discounted Kilogram Years is expressed in present value 2010 kilogram years.

Discounted Service Acre Years is expressed in present value 2010 service acre years.

Estuarine Dependent Aquatic Biomass: Is defined as the biomass of aquatic species that depend on the habitat found within estuaries for at least one stage of their life cycle.

Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat- is defined as the biomass of those fishes and crustaceans that depend on the habitat found within oyster reefs and other estuarine hard bottom/structural habitat for at least one stage of their life cycle. Applicable to this project only, this definition includes the individual species listed below in Table C- 1 which are a subset of species listed in Attachment A. As part of the ongoing NRD Assessment, the species in Table C- 1 or Attachment A may be shifted or consolidated within or between the groups, but none of the species listed in Table C- 1 will be removed from this definition. Any consolidation or shifting of species between groups, renaming or dividing of groups, or removal of species currently listed in Attachment A, that are determined by the Trustees in the final NRD Assessment, must have a reliable scientific basis.

Groups:

- Crabs and Lobsters
- Drums and Seatrout
- Forage Fish
- Other Demersal Fish
- Other Reef Associated Fish
- Shrimp
- Brown Shrimp

Federal Waters on the Continental Shelf, **for projects located in Mississippi**, refers to the area of water extending from the outer boundary of Mississippi state waters to the edge of the Continental Shelf, excluding any area within the state waters of Texas, Louisiana, Mississippi, Alabama, or Florida.

Federal Waters on the Continental Shelf, for projects located in Alabama, refers to the area of water extending from the outer boundary of Alabama state waters to the edge of the Continental Shelf, excluding any area within the state waters of Texas, Louisiana, Mississippi, Alabama, or Florida.

Salt Marsh Habitat refers to transitional marsh areas between land and water that occur in coastal areas at salinities at or approaching that of ocean water. Typical vegetation in salt marsh habitat includes species such as *Spartina alterniflora*, *Juncus roemerianus*, and *Distichlis spicata*.

Secondary Productivity: The strict definition of secondary productivity is the rate of production of consumers (heterotrophs) in an ecosystem (Edmondson & Winberg, 1971). For purposes of the Offsets for this living shoreline, subtidal and intertidal reef project, it is more narrowly defined as production of herbivores and detritivores, (the P2 production level in Odum, 1959) and in particular, the net production of mobile and sessile invertebrate infauna and epifauna associated with hard bottom substrates.

- Odum 1959, Fundamentals of Ecology, Second edition. Philadelphia and London: W.B. Saunders & Co Philadelphia, *546 p.*
- Edmondson, W.T. & G.G.Winberg (Eds.). 1971. A manual on methods for the assessment of secondary productivity in fresh waters. London. 358 pp. (IBP Handbook 17).

Table C- 1. Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom / Structural Habitats and their Assigned Species Groups from Attachment A.

Scientific Name	Common Name	Groups
Farfantepenaeus aztecus	brown shrimp	Brown Shrimp
Callinectes sapidus	blue crab	Crabs and Lobsters
Callinectes similis	lesser blue crab	Crabs and Lobsters
Dyspanopeus texanus	Gulf grassflat crab	Crabs and Lobsters
Menippe adina	Gulf stone crab	Crabs and Lobsters
Cynoscion arenarius	sand seatrout	Drums and Seatrout
Cynoscion nebulosus	spotted seatrout	Drums and Seatrout
Cynoscion nothus	silver seatrout	Drums and Seatrout
Equetus lanceolatus	spotted drum	Drums and Seatrout
Larimus fasciatus	banded drum	Drums and Seatrout
Leiostomus xanthurus	Spot	Drums and Seatrout
Micropogonias undulatus	Atlantic croaker	Drums and Seatrout
Pareques acuminatus	high-hat drum	Drums and Seatrout
Pareques iwamotoi	blackbar drum	Drums and Seatrout
Pogonias cromis	black drum	Drums and Seatrout

Scientific Name	Common Name	Groups
Sciaenops ocellatus	red drum	Drums and Seatrout
Stellifer lanceolatus	American stardrum	Drums and Seatrout
Alosa alabamae	Alabama shad	Forage Fish
Alosa chrysochloris	skipjack shad	Forage Fish
Anchoa cubana	Cuban anchovy	Forage Fish
Anchoa hepsetus	striped anchovy	Forage Fish
Anchoa lyolepis	shortfinger anchovy	Forage Fish
Anchoa mitchilli	Bay anchovy	Forage Fish
Anchoviella perfasciata	Poey's anchovy	Forage Fish
Brevoortia gunteri	finescale menhaden	Forage Fish
Brevoortia patronus	Gulf menhaden	Forage Fish
Dorosoma petenense	threadfin shad	Forage Fish
Engraulis eurystole	silver anchovy	Forage Fish
Harengula clupeola	false pachard	Forage Fish
Harengula humeralis	redear sardine	Forage Fish
Harengula jaguana	sacled herring	Forage Fish
Jenkinsia lamprotaenia	dwark round herring	Forage Fish
Menidia beryllina	inland silverside	Forage Fish
Opisthonema oglinum	Atlantic threadfin herring	Forage Fish
Calamus arctifrons	grass porgy	Other Demersal Fish
Calamus leucosteus	whitebone porgy	Other Demersal Fish
Lagodon rhomboides	Pinfish	Other Demersal Fish
Opsanus beta	Gulf toadfish	Other Demersal Fish
Pagrus pagrus	red porgy	Other Demersal Fish
Prionotus tribulus	bighead searobin	Other Demersal Fish
Stenotomus caprinus	longspine porgy	Other Demersal Fish
Archosargus probatocephalus	Sheepshead	Other Reef Associated Fish
Bollmania communis	ragged goby	Other Reef-Associated
Calamus bajonado	jolthead porgy	Other Reef-Associated
Calamus calamus	saucereye porgy	Other Reef-Associated
Calamus nodosus	knobbed porgy	Other Reef-Associated
Calamus penna	sheepshead porgy	Other Reef-Associated
Gobionellus boleosoma	Darter goby	Other Reef-Associated
Gobionellus oceanicus	highfin goby	Other Reef-Associated
Gobiosoma bosc	naked goby	Other Reef-Associated
Goboides broussoneti	violet goby	Other Reef-Associated
Microgobius gulosus	clown goby	Other Reef-Associated
Farfantepenaeus duorarum	pink shrimp	Shrimp
Penaeus setiferus	White shrimp	Shrimp

Attachment A. List of Species Associated with Each Species Categorization Grouping

Total Count: 66	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Acanthaxius hirsutimanus	mud lobster	Crabs and Lobsters
Acanthilia intermedia	granulose purse crab	Crabs and Lobsters
Acanthocarpus alexandri	gladiator box crab	Crabs and Lobsters
Anasimus latus	stilt spider crab	Crabs and Lobsters
Arenaeus cribrarius	speckled swimming crab	Crabs and Lobsters
Calappa flammea	flamed box crab	Crabs and Lobsters
Calappa sulcata	shame-faced box crab	Crabs and Lobsters
Callinectes sapidus	blue crab	Crabs and Lobsters
Callinectes similis	lesser blue crab	Crabs and Lobsters
Collodes robustus	deepsea crab	Crabs and Lobsters
Danielum ixbauchac	articulated crab	Crabs and Lobsters
Dardanus fucosus	bareye hemit crab	Crabs and Lobsters
Dardanus insignis	red brocade hermit crab	Crabs and Lobsters
Dyspanopeus texanus	Gulf grassflat crab	Crabs and Lobsters
Ethusa microphthalma	broadback sumo crab	Crabs and Lobsters
Euphrosynoplax clausa	craggy bathyal crab	Crabs and Lobsters
Hepatus epheliticus	calico crab	Crabs and Lobsters
Iliacantha liodactylus	purse crab	Crabs and Lobsters
Iliacantha subglobosa	purse crab	Crabs and Lobsters
Leiolambrus nitidus	white elbow crab	Crabs and Lobsters
Libinia dubia	longnose spider crab	Crabs and Lobsters
Libinia emarginata	portly spider crab	Crabs and Lobsters
Menippe adina	Gulf stone crab	Crabs and Lobsters
Menippe mercenaria	Florida stone crab	Crabs and Lobsters
Menippe zoeae	stone crab unspecified	Crabs and Lobsters
Metoporhaphis calcarata	false arrow crab	Crabs and Lobsters
Munida forceps	squat lobster	Crabs and Lobsters
Myropsis quinquespinosa	fivespine purse crab	Crabs and Lobsters
Nanoplax xanthiformis	rough squareback crab	Crabs and Lobsters
Nephropsis aculeata	Florida lobsterette	Crabs and Lobsters
Ovalipes floridanus	Florida lady crab	Crabs and Lobsters
Ovalipes stephensoni	coarsehand lady crab	Crabs and Lobsters
Paguristes lymani	hermit crab	Crabs and Lobsters
Paguristes sericeus	hermit crab	Crabs and Lobsters
Paguristes triangulatus	hermit crab	Crabs and Lobsters
Pagurus bullisi	hermit crab	Crabs and Lobsters
Pagurus longicarpus	longwristed hermit crab	Crabs and Lobsters
Pagurus pollicaris	flat-clawed hermit crab	Crabs and Lobsters
Panulirus argus	Spiny lobsters	Crabs and Lobsters
Parthenope agonus	crab	Crabs and Lobsters
Parthenope serrata	crab	Crabs and Lobsters

Total Count: 66	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Persephona crinita	pink purse crab	Crabs and Lobsters
Persephona mediterranea	purse crab	Crabs and Lobsters
Petrochirus diogenes	giant hermit crab	Crabs and Lobsters
Platylambrus granulata	bladetooth elbow crab	Crabs and Lobsters
Podochela sidneyi	shortfinger neck crab	Crabs and Lobsters
Porcellana sayana	porcelain crab	Crabs and Lobsters
Porcellana sigsbeiana	porcelain crab	Crabs and Lobsters
Portunidae megalopae	Portunidae (swimming crab) unspecified	Crabs and Lobsters
Portunidae zoeae	Portunidae (swimming crab) unspecified	Crabs and Lobsters
Portunus gibbesii	iridescent swimming crab	Crabs and Lobsters
Portunus sayi	Sargassum swimming crab	Crabs and Lobsters
Portunus spinicarpus	longspine swimming crab	Crabs and Lobsters
Portunus spinimanus	blotched swimming crab	Crabs and Lobsters
Portunus ventralis	swimming crab	Crabs and Lobsters
Pseudomedaeus agassizii	mud crab	Crabs and Lobsters
Raninoides loevis	furrowed frog crab	Crabs and Lobsters
Raninoides louisianensis	Gulf frog crab	Crabs and Lobsters
Rhithropanopeus harrisii	estuarine mud crab	Crabs and Lobsters
Scyllarides latus	Slipper Lobster	Crabs and Lobsters
Scyllarides nodifer	ridged slipper lobster	Crabs and Lobsters
Scyllarus chacei	chace slipper lobster	Crabs and Lobsters
Speocarcinus lobatus	Gulf squareback crab	Crabs and Lobsters
Stenocionops furcatus	spider crab	Crabs and Lobsters
Stenocionops spinimanus	spider crab	Crabs and Lobsters
Stenorhynchus seticornis	yellowline arrow crab	Crabs and Lobsters

[1] See Appendix C, Glossary of Terms: "Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat"

Total Count: 18	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Bairdiella chrysoura	silver perch	Drums and Seatrout
Cynoscion arenarius	sand seatrout	Drums and Seatrout
Cynoscion nebulosus	spotted seatrout	Drums and Seatrout
Cynoscion nothus	silver seatrout	Drums and Seatrout
Equetus lanceolatus	spotted drum	Drums and Seatrout
Larimus fasciatus	banded drum	Drums and Seatrout
Leiostomus xanthurus	spot	Drums and Seatrout
Menticirrhus americanus	southern kingfish	Drums and Seatrout
Menticirrhus littoralis	Gulf kingfish	Drums and Seatrout
Menticirrhus saxatilis	northern kingfish	Drums and Seatrout
Micropogonias undulatus	Atlantic croaker	Drums and Seatrout
Pareques acuminatus	high-hat drum	Drums and Seatrout
Pareques iwamotoi	blackbar drum	Drums and Seatrout
Pareques umbrosus	cubbyu	Drums and Seatrout
Pogonias cromis	black drum	Drums and Seatrout
Sciaenops ocellatus	red drum	Drums and Seatrout
Stellifer brasiliensis		Drums and Seatrout
Stellifer lanceolatus	American stardrum	Drums and Seatrout

[1] See Appendix C, Glossary of Terms: "Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat"

Total Count: 26	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Alosa alabamae	Alabama Shad	Forage Fish
Alosa chrysochloris	skipjack shad	Forage Fish
Anchoa cubana	Cuban anchovy	Forage Fish
Anchoa hepsetus	striped anchovy	Forage Fish
Anchoa lyolepis	shortfinger anchovy	Forage Fish
Anchoa mitchilli	bay anchovy	Forage Fish
Anchoviella perfasciata	Poey's anchovy	Forage Fish
Brevoortia gunteri	Finescale menhaden	Forage Fish
Brevoortia patronus	Gulf menhaden	Forage Fish
Brevoortia smithi	yellowfin menhaden	Forage Fish
Dorosoma cepedianum	gizzard shad	Forage Fish
Dorosoma petenense	threadfin shad	Forage Fish
Engraulis eurystole	silver anchovy	Forage Fish
Etrumeus teres	round herring	Forage Fish
Harengula jaguana	scaled herring	Forage Fish
Jenkinsia lamprotaenia	dwarf round herring	Forage Fish
Jenkinsia majua	little-eye herring	Forage Fish
Jenkinsia stolifera	shortband herring	Forage Fish
Menidia beryllina	inland silverside	Forage Fish
Mugil cephalus	striped mullet	Forage Fish
Mugil curema	white mullet	Forage Fish
Opisthonema oglinum	Atlantic threadfin herring	Forage Fish
Peprilus alepidotus	harvestfish (butterfish)	Forage Fish
Peprilus burti	Gulf butterfish	Forage Fish
Peprilus paru	American harvestfish (butterfish)	Forage Fish
Peprilus triacanthus	butterfish	Forage Fish

[1] See Appendix C, Glossary of Terms: "Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat"

Total Count: 159	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Acanthonus armatus	bony-eared assfish	Other Demersal Fish
Aldrovandia affinis	Gilbert's halosaur	Other Demersal Fish
Aldrovandia gracilis	halosaur	Other Demersal Fish
Alepocephalus agassizii	Agassiz slickhead	Other Demersal Fish
Alepocephalus productus	smalleye smoothhead	Other Demersal Fish
Aluterus heudelotii	dotterel filefish	Other Demersal Fish
Anguilla rostrata	American Eel	Other Demersal Fish
Anisarchus medius	stout eelblenny	Other Demersal Fish
Antennarius radiosus	singlespot frogfish	Other Demersal Fish
Antigonia capros	deepbody boarfish	Other Demersal Fish
Argentina striata	striated argentine	Other Demersal Fish
Argyripnus atlanticus		Other Demersal Fish
Ariomma bondi	silver-rag driftfish	Other Demersal Fish
Bagre marinus	gafftopsail catfish	Other Demersal Fish
Barathrites iris	cusk eel	Other Demersal Fish
Barathrodemus manatinus	cusk eel	Other Demersal Fish
Bassozetus robustus	robust assfish	Other Demersal Fish
Bathygadus macrops	bullseye grenadier	Other Demersal Fish
Bathygadus melanobranchus	Vaillant's grenadier	Other Demersal Fish
Bathyonus pectoralis	cusk eel	Other Demersal Fish
Bathypterois grallator	tripod fish	Other Demersal Fish
Bathypterois phenax	blackfin spiderfish	Other Demersal Fish
Bathysaurus mollis	highfin lizardfish	Other Demersal Fish
Bathytroctes macrolepis	Koefoed's smooth-head	Other Demersal Fish
Bathytroctes microlepis	Smallscale smooth-head	Other Demersal Fish
Bathytyphlops sewelli	tripod fish	Other Demersal Fish
Bellator brachychir	shortfin searobin	Other Demersal Fish
Bellator egretta	streamer searobin	Other Demersal Fish
Bellator militaris	horned searobin	Other Demersal Fish
Bellocia koefoedi		Other Demersal Fish
Bembrops anatirostris	duckbill flathead	Other Demersal Fish
Bembrops gobioides	goby flathead	Other Demersal Fish
Calamus arctifrons	grass porgy	Other Demersal Fish
Calamus leucosteus	whitebone porgy	Other Demersal Fish
Caulolatilus chrysops	Atlantic goldeye tilefish	Other Demersal Fish
Chaunax suttkusi	toadfish	Other Demersal Fish
Chlorophthalmus agassizi	shortnose greeneye	Other Demersal Fish
Coelorinchus caelorhincus	saddled grenadier	Other Demersal Fish
Coelorinchus caribbaeus	blackfin grenadier	Other Demersal Fish
Coelorinchus occa	swordsnout grenadier	Other Demersal Fish
Coloconger meadi	worm eel	Other Demersal Fish
Conocara macropterum	longfin smooth-head	Other Demersal Fish
Coryphaenoides alateralis	grenadier	Other Demersal Fish

Total Count: 159	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Coryphaenoides rudis	rudis rattail	Other Demersal Fish
Cyttopsis rosea	rosy dory	Other Demersal Fish
Dibranchus atlanticus	Atlantic batfish	Other Demersal Fish
Dicrolene introniger	digitate cusk eel	Other Demersal Fish
Dormitator maculatus	fat sleeper	Other Demersal Fish
Dysomma anguillare	shortbelly eel	Other Demersal Fish
Eleotris pisonis	spinycheek sleeper	Other Demersal Fish
Enchelyopus cimbrius	four-bearded rockling	Other Demersal Fish
Epigonus pandionis	bigeye cardinalfish	Other Demersal Fish
Eucinostomus harengulus	tidewater mojarra	Other Demersal Fish
Foetorepus goodenbeani	palefin dragonet	Other Demersal Fish
Gadella imberbis	beardless codling	Other Demersal Fish
Gadomus arcuatus	doublethread grenadier	Other Demersal Fish
Gadomus longifilis	threadfin grenadier	Other Demersal Fish
Gibberichthys pumilus	gibberfish	Other Demersal Fish
Gnathagnus egregius	freckled stargazer	Other Demersal Fish
Gymnothorax kolpos	blacktail moray eel	Other Demersal Fish
Gymnothorax saxicola	ocellated moray	Other Demersal Fish
Halosaurus guentheri	Halosaur	Other Demersal Fish
Halosaurus ovenii	Halosaur	Other Demersal Fish
Hoplostethus occidentalis	western roughy	Other Demersal Fish
Hoplunnis diomediana	blacktail pike-conger	Other Demersal Fish
Hoplunnis macrura	freckled pike-conger	Other Demersal Fish
Hoplunnis tenuis	spotted pike-conger	Other Demersal Fish
Howella brodiei	pelagic basslet	Other Demersal Fish
Hydrolagus alberti	Gulf chimera	Other Demersal Fish
Hydrolagus mirabilis	large-eyed rabbitfish	Other Demersal Fish
Hymenocephalus billsam	rattail	Other Demersal Fish
Hymenocephalus italicus	glasshead grenadier	Other Demersal Fish
Ipnops murrayi	deepsea tripod fish	Other Demersal Fish
Kathetostoma albigutta	lancer stargazer	Other Demersal Fish
Lagodon rhomboides	pinfish	Other Demersal Fish
Lepophidium brevibarbe	shortbeard cusk-eel	Other Demersal Fish
Lepophidium staurophor	barred cusk-eel	Other Demersal Fish
Leptoderma macrops	slickhead	Other Demersal Fish
Lophius americanus	American angler	Other Demersal Fish
Lophius gastrophysus	blackfin goosefish	Other Demersal Fish
Lophius vomerinus	devil anglerfish	Other Demersal Fish
Lyopsetta exilis	slender sole	Other Demersal Fish
Macrocallista nimbosa	sunray venus	Other Demersal Fish
Malacocephalus laevis	softhead grenadier	Other Demersal Fish
Merluccius albidus	offshore hake	Other Demersal Fish
Merluccius bilinearis	silver hake	Other Demersal Fish

Total Count: 159	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Merluccius productus	North Pacific hake	Other Demersal Fish
Monolene sessilicauda	deepwater flounder	Other Demersal Fish
Monomitopus agassizii	cusk eel	Other Demersal Fish
Monomitopus magnus	cusk eel	Other Demersal Fish
Narcetes stomias	slickhead	Other Demersal Fish
Neobythites gilli	twospot brotula	Other Demersal Fish
Neomerinthe hemingwayi	spinycheek scorpionfish	Other Demersal Fish
Neoscopelus microchir	shortfin neoscopelid	Other Demersal Fish
Nezumia aequalis	common Atlantic grenadier	Other Demersal Fish
Nezumia cyrano	cyrano grenadier	Other Demersal Fish
Nezumia suilla	suilla grenadier	Other Demersal Fish
Ogcocephalus corniger	longnose batfish	Other Demersal Fish
Ogcocephalus pantostictus	spotted batfish	Other Demersal Fish
Ogcocephalus radiatus	batfish	Other Demersal Fish
Ophidion marginatum	striped cusk-eel	Other Demersal Fish
Opistognathidae spp.	jawfish unspecified	Other Demersal Fish
Opsanus beta	Gulf toadfish	Other Demersal Fish
Orthopristis chrysoptera	pigfish	Other Demersal Fish
Otophidium omostigma	polka-dot cusk-eel	Other Demersal Fish
Pagrus pagrus	red porgy	Other Demersal Fish
Parasudis truculenta	greeneye	Other Demersal Fish
Penopus macdonaldi		Other Demersal Fish
Penopus microphthalmus	cusk eel	Other Demersal Fish
Peristedion gracile	slender searobin	Other Demersal Fish
Peristedion greyae	alligator searobin	Other Demersal Fish
Peristedion miniatum	armored searobin	Other Demersal Fish
Peristedion thompsoni	rimspine searobin	Other Demersal Fish
Polydactylus octonemus	Atlantic threadfin	Other Demersal Fish
Polymetme corythaeola	rendezvous fish	Other Demersal Fish
Polymixia lowei	beardfish	Other Demersal Fish
Polymixia nobilis	stout beardfish	Other Demersal Fish
Pontinus longispinis	longspine scorpionfish	Other Demersal Fish
Porichthys plectrodon	Atlantic midshipman	Other Demersal Fish
Porogadus catena	cusk eel	Other Demersal Fish
Porogadus miles	slender cusk eel	Other Demersal Fish
Prionotus alatus	spiny searobin	Other Demersal Fish
Prionotus carolinus	northern searobin	Other Demersal Fish
Prionotus longispinosus	bigeye searobin	Other Demersal Fish
Prionotus martis	Gulf of Mexico barred searobin	Other Demersal Fish
Prionotus paralatus	Mexican searobin	Other Demersal Fish
Prionotus roseus	bluespotted searobin	Other Demersal Fish
Prionotus rubio	blackwing searobin	Other Demersal Fish
Prionotus scitulus	leopard searobin	Other Demersal Fish

Total Count: 159	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Prionotus stearnsi	shortwing searobin	Other Demersal Fish
Prionotus tribulus	bighead searobin	Other Demersal Fish
Pristis pectinata	smalltooth sawfish	Other Demersal Fish
Rinoctes nasutus	abyssal smooth-head	Other Demersal Fish
Rouleina maderensis	madeiran smooth-head	Other Demersal Fish
Scorpaena agassizii	longfin scorpionfish	Other Demersal Fish
Setarches guentheri	channeled rockfish	Other Demersal Fish
Sphoeroides dorsalis	marbled puffer	Other Demersal Fish
Sphoeroides parvus	least puffer	Other Demersal Fish
Steindachneria argentea	luminous hake	Other Demersal Fish
Stenotomus caprinus	longspine porgy	Other Demersal Fish
Stephanoberyx monae	pricklefish	Other Demersal Fish
Symphurus atricaudus	California tonguefish	Other Demersal Fish
Synagrops bellus	blackmouth bass	Other Demersal Fish
Synagrops spinosus	keelsheek bass	Other Demersal Fish
Synaphobranchus affinis	grey cutthroat eel	Other Demersal Fish
Synaphobranchus oregoni	cutthroat eel	Other Demersal Fish
Talismania antillarum	slickheads/nakedheads	Other Demersal Fish
Trachonurus sulcatus	bristly grenadier	Other Demersal Fish
Urophycis cirrata	Gulf hake	Other Demersal Fish
Urophycis floridana	southern codling	Other Demersal Fish
Urophycis regia	spotted codling	Other Demersal Fish
Venefica procera	witch eel	Other Demersal Fish
Ventrifossa macropogon	longbeard grenadier	Other Demersal Fish
Xenocephalus egregius	freckled stargazer	Other Demersal Fish
Zalieutes mcgintyi	tricorn batfish	Other Demersal Fish
Zenopsis conchifer	Silver John dory	Other Demersal Fish

[1] See Appendix C, Glossary of Terms: "Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat"

Total Count: 133	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Ahlia egmontis	key worm eel	Other Reef-Associated
Aluterus monoceros	unicorn leatherjacket filefish	Other Reef-Associated
Aluterus schoepfii	orange filefish	Other Reef-Associated
Aluterus scriptus	scrawled filefish	Other Reef-Associated
Anisotremus surinamensis	black margate	Other Reef-Associated
Aplatophis chauliodus	tusky eel	Other Reef-Associated
Apogon affinis	bigtooth cardinalfish	Other Reef-Associated
Apogon aurolineatus	bridle cardinalfish	Other Reef-Associated
Apogon maculatus	flamefish	Other Reef-Associated
Apogon pseudomaculatus	twospot cardinalfish	Other Reef-Associated
Archosargus probatocephalus	sheepshead	Other Reef-Associated
Ariopsis felis	hardhead catfish	Other Reef-Associated
Ariosoma balearicum	bandtooth conger	Other Reef-Associated
Astroscopus y-graecum	southern stargazer	Other Reef-Associated
Avocettina infans	avocet snipe eel	Other Reef-Associated
Balistes capriscus	gray triggerfish	Other Reef-Associated
Bassogigas gillii	cusk eel	Other Reef-Associated
Benthodesmus tenuis	slender frostfish	Other Reef-Associated
Bollmannia communis	ragged goby	Other Reef-Associated
Bothus ocellatus	eyed flounder	Other Reef-Associated
Brotula barbata	bearded brotula	Other Reef-Associated
Calamus bajonado	jolthead porgy	Other Reef-Associated
Calamus calamus	saucereye porgy	Other Reef-Associated
Calamus nodosus	knobbed porgy	Other Reef-Associated
Calamus penna	sheepshead porgy	Other Reef-Associated
Calamus proridens	littlehead porgy	Other Reef-Associated
Callechelys guineensis	shorttail snake eel	Other Reef-Associated
Callechelys muraena	blotched snake eel	Other Reef-Associated
Cantherhines pullus	chivo	Other Reef-Associated
Canthidermis maculata	rough triggerfish	Other Reef-Associated
Canthidermis sufflamen	ocean triggerfish	Other Reef-Associated
Carapus bermudensis	pearlfish	Other Reef-Associated
Caulolatilus intermedius	Gulf bareye tilefish	Other Reef-Associated
Caulolatilus microps	grey tilefish	Other Reef-Associated
Centropyge argi	cherubfish	Other Reef-Associated
Centropyge bicolor	bicolor angelfish	Other Reef-Associated
Chaetodipterus faber	Atlantic spadefish	Other Reef-Associated
Chilomycterus antennatus	bridled boxfish	Other Reef-Associated
Chilomycterus schoepfii	spiny boxfish	Other Reef-Associated
Conger oceanicus	American conger	Other Reef-Associated
Dactylopterus volitans	flying gurnard	Other Reef-Associated
Decodon puellaris	red hogfish	Other Reef-Associated
Dicrolene kanazawai	cusk eel	Other Reef-Associated

Total Count: 133	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Echeneis naucrates	slender sharksucker	Other Reef-Associated
Echeneis neucratoides	whitefin sharksucker	Other Reef-Associated
Echiophis intertinctus	spotted spoon-nose eel	Other Reef-Associated
Echiophis punctifer	stippled spoon-nose eel	Other Reef-Associated
Eucinostomus argenteus	spotfin mojarra	Other Reef-Associated
Eucinostomus gula	silver jenny	Other Reef-Associated
Fistularia petimba	red cornetfish	Other Reef-Associated
Fistularia tabacaria	cornetfish	Other Reef-Associated
Gobioides broussoneti	violet goby	Other Reef-Associated
Gobionellus boleosoma	darter goby	Other Reef-Associated
Gobionellus hastatus	sharptail goby	Other Reef-Associated
Gobionellus oceanicus	highfin goby	Other Reef-Associated
Gobiosoma bosc	naked goby	Other Reef-Associated
Gymnothorax moringa	spotted moray	Other Reef-Associated
Haemulon aurolineatum	tomtate grunt	Other Reef-Associated
Haemulon plumierii	white grunt	Other Reef-Associated
Haemulon sciurus	blue-striped grunt	Other Reef-Associated
Halieutichthys aculeatus	pancake batfish	Other Reef-Associated
Harengula clupeola	false pichard	Other Reef-Associated
Harengula humeralis	redear sardine	Other Reef-Associated
Hemiramphus brasiliensis	ballyhoo	Other Reef-Associated
Hippocampus erectus	lined seahorse	Other Reef-Associated
Histrio histrio	sargassumfish	Other Reef-Associated
Holacanthus bermudensis	Bermuda blue angelfish	Other Reef-Associated
Hypleurochilus geminatus	crested blenny	Other Reef-Associated
Kyphosus sectator	Bermuda chub	Other Reef-Associated
Lachnolaimus maximus	hogfish	Other Reef-Associated
Lagocephalus laevigatus	smooth puffer	Other Reef-Associated
Lepophidium jeannae	mottled cusk-eel	Other Reef-Associated
Lobotes surinamensis	Atlantic tripletail	Other Reef-Associated
Microgobius gulosus	clown goby	Other Reef-Associated
Monacanthus ciliatus	fringed filefish	Other Reef-Associated
Mulloidichthys martinicus	yellow goatfish	Other Reef-Associated
Mullus auratus	red goatfish	Other Reef-Associated
Ogcocephalus cubifrons	batfish	Other Reef-Associated
Ogcocephalus nasutus	shortnose batfish	Other Reef-Associated
Ogcocephalus parvus	roughback batfish	Other Reef-Associated
Ophichthus gomesii	shrimp eel	Other Reef-Associated
Ophichthus punticeps	palespotted eel	Other Reef-Associated
Ophichthus rex	king snake eel	Other Reef-Associated
Ophidion grayi	blotched cusk-eel	Other Reef-Associated
Ophidion holbrookii	band cusk-eel	Other Reef-Associated
Ophidion josephi	cusk-eel	Other Reef-Associated

Total Count: 133	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Ophidion selenops	mooneye cusk-eel	Other Reef-Associated
Opistognathus aurifrons	yellowhead jawfish	Other Reef-Associated
Opsanus pardus	leopard toadfish	Other Reef-Associated
Parablennius marmoreus	seaweed blenny	Other Reef-Associated
Parablennius ruber	Portuguese blenny	Other Reef-Associated
Paraconger caudilimbatus	margintail conger	Other Reef-Associated
Priacanthus arenatus	Atlantic bigeye	Other Reef-Associated
Prionotus ophryas	bandtail searobin	Other Reef-Associated
Pristigenys alta	short bigeye	Other Reef-Associated
Pseudupeneus maculatus	spotted goatfish	Other Reef-Associated
Remora remora	common remora	Other Reef-Associated
Rhynchoconger flavus	yellow conger	Other Reef-Associated
Sardinella aurita	Spanish sardine	Other Reef-Associated
Saurida brasiliensis	Brazilian lizardfish	Other Reef-Associated
Saurida caribbaea	smallscale lizardfish	Other Reef-Associated
Saurida normani	shortjaw lizardfish	Other Reef-Associated
Scorpaena brasiliensis	barbfish	Other Reef-Associated
Scorpaena calcarata	smooth-head scorpionfish	Other Reef-Associated
Scorpaena plumieri	spotted scorpionfish	Other Reef-Associated
Sparisoma viride	stoplight parrotfish	Other Reef-Associated
Sphoeroides nephelus	southern puffer	Other Reef-Associated
Sphoeroides spengleri	bandtail puffer	Other Reef-Associated
Sphoeroides testudineus	checkered puffer	Other Reef-Associated
Sphyraena barracuda	great barracuda	Other Reef-Associated
Sphyraena borealis	northern sennet	Other Reef-Associated
Sphyraena guachancho	Guachanche barracuda	Other Reef-Associated
Sphyraena sphyraena	European barracuda	Other Reef-Associated
Stegastes variabilis	cocoa damselfish	Other Reef-Associated
Stephanolepis hispidus	planehead filefish	Other Reef-Associated
Stephanolepis setifer	planehead filefish	Other Reef-Associated
Strongylura marina	Atlantic needlefish	Other Reef-Associated
Syngnathiformes spp.	Syngnathiformes	Other Reef-Associated
Syngnathus louisianae	chain pipefish	Other Reef-Associated
Synodus foetens	inshore lizardfish	Other Reef-Associated
Synodus intermedius	sand diver	Other Reef-Associated
Synodus poeyi	offshore lizardfish	Other Reef-Associated
Synodus synodus	diamond lizardfish	Other Reef-Associated
Thalassoma bifasciatum	bluehead	Other Reef-Associated
Trachinocephaulus myops	snakefish	Other Reef-Associated
Trichiurus lepturus	Atlantic cutlassfish	Other Reef-Associated
Upeneus moluccensis	goldband goldfish	Other Reef-Associated
Upeneus parvus	dwarf goatfish	Other Reef-Associated
Xyelacyba myersi	gargoyle cusk	Other Reef-Associated

Total Count: 133	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Xyrichtys martinicensis	rosy razorfish	Other Reef-Associated
Xyrichtys novacula	pearly razorfish	Other Reef-Associated
Xyrichtys martinicensis	rosy razorfish	Other Reef-Associated
Xyrichtys novacula	pearly razorfish	Other Reef-Associated

[1] See Appendix C, Glossary of Terms: "Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat"

Total Count: 1	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Farfantepenaeus aztecus	brown shrimp	Brown Shrimp

[1] See Appendix C, Glossary of Terms: "Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat"

Total Count: 35	Species Output	
Scientific Name	**Common Name**	**Current Grouping[1]**
Alpheus floridanus	banded snapping shrimp	Shrimp
Gibbesia neglecta	lesser mantis shrimp	Shrimp
Litopenaeus setiferus	white shrimp	Shrimp
Lysiosquilla scabricauda	scaly-tailed mantis shrimp	Shrimp
Lysmata wurdemanni	peppermint shrimp	Shrimp
Mysid shrimp	mysid shrimp unspecified	Shrimp
Parapenaeus politus	deep-water rose shrimp	Shrimp
Parasquilla coccinea	shrimp	Shrimp
Penaeidae larvae	Penaeid shrimp unspecified	Shrimp
Penaeidae postlarvae	Penaeid shrimp unspecified	Shrimp
Penaeus aztecus	northern brown shrimp	Shrimp
Penaeus duorarum	northern pink shrimp	Shrimp
Penaeus setiferus	northern white shrimp	Shrimp
Pleoticus robustus	royal red shrimp	Shrimp
Plesionika edwardsii	soldier striped shrimp	Shrimp
Plesionika longicauda	striped shrimp	Shrimp
Plesionika longipes	striped shrimp	Shrimp
Rimapenaeus constrictus	roughneck shrimp	Shrimp
Rimapenaeus similis	roughback shrimp	Shrimp
Sicyonia brevirostris	brown rock shrimp	Shrimp
Sicyonia burkenroadi	rock shrimp	Shrimp
Sicyonia dorsalis	rock shrimp	Shrimp
Sicyonia parri	rock shrimp	Shrimp
Sicyonia penicillata	Target Rock Shrimp	Shrimp
Sicyonia typica	rock shrimp	Shrimp
Sicyoniidae postlarvae	rock shrimp unspecified	Shrimp
Solenocera atlantidis	dwarf humpback shrimp	Shrimp
Solenocera vioscai	humpback shrimp	Shrimp
Squilla chydaea	offshore mantis shrimp	Shrimp
Squilla deceptrix	mantis shrimp	Shrimp
Squilla edentata	mantis shrimp	Shrimp
Squilla empusa	mantis shrimp	Shrimp
Stenopus scutellatus	gold coral banded shrimp	Shrimp
Xiphopenaeus kroyeri	seabob shrimp	Shrimp

[1] See Appendix C, Glossary of Terms: "Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat"

Appendix D. Guidelines for NEPA Impact Determinations from the Final Phase III ERP/PEIS

As discussed in Chapters 5 through 14, agencies must consider the environmental effects of their actions. These effects may include, among others, impacts to social, cultural, and economic resources, as well as natural resources. To identify those resources that could be significantly impacted by the proposed alternatives and actions, appropriate definitions of *impacts* must first be identified. Table D- 1 provides guidelines for resource-specific definitions for determining effects of individual planned actions. These definitions were also included and described in the Final Phase III ERP/PEIS.

Table D- 1. Guidelines for NEPA Impact Determinations in the Phase IV ERP/EAs

		IMPACT INTENSITY DEFINITIONS		
RESOURCE AREA	**IMPACT DURATION**	**MINOR**	**MODERATE**	**MAJOR**
Geology and Substrates	Short-term: During construction period. Long-term: Over the life of the project or longer.	Disturbance to geologic features or soils could be detectable, but could be small and localized. There could be no changes to local geologic features or soil characteristics. Erosion and/or compaction could occur in localized areas.	Disturbance could occur over local and immediately adjacent areas. Impacts to geology or soils could be readily apparent and result in changes to the soil character or local geologic characteristics. Erosion and compaction impacts could occur over local and immediately adjacent areas.	Disturbance could occur over a wide-spread area. Impacts to geology or soils could be readily apparent and could result in changes to the character of the geology or soils over a wide-spread area. Erosion and compaction could occur over a wide-spread area. Disruptions to substrates or soils may be permanent.
Hydrology and Water Quality	Short-term: During construction period. Long-term: Over the life of the project or longer.	Hydrology: The effect on hydrology could be measurable, but it could be small and localized. The effect could only temporarily alter the area's hydrology, including surface and groundwater flows. Water Quality: Impacts could result in a detectable change to water quality, but the change could be expected to be small and localized. Impacts could quickly become undetectable. State water quality standards as required by the Clean Water Act could not be exceeded. Floodplains: Impacts may result in a detectable change to natural and beneficial floodplain values, but the change could be expected to be small, and localized. There could be no appreciable increased risk of flood loss including impacts on human safety, health, and welfare. Wetlands: The effect on wetlands could be measurable, but small in	Hydrology: The effect on hydrology could be measurable, but small and limited to local and adjacent areas. The effect could permanently alter the areas hydrology including surface and groundwater flows. Water Quality: Effects to water quality could be observable over a relatively large area. Impacts could result in a change to water quality that could be readily detectable and limited to local and adjacent areas. Change in water quality could persist; however, could likely not exceed state water quality standards as required by the Clean Water Act. Floodplains: Impacts could result in a change to natural and beneficial floodplain values and could be readily detectable, but limited to local and adjacent areas. Location of operations in floodplains could increase risk of flood loss including impacts on human safety, health, and welfare.	Hydrology: The effect on hydrology could be measurable and wide-spread. The effect could permanently alter hydrologic patterns including surface and groundwater flows. Water Quality: Impacts could likely result in a change to water quality that could be readily detectable and wide-spread. Impacts could likely result in exceedance of state water quality standards and/or could impair designated uses of a water body. Floodplains: Impacts could result in a change to natural and beneficial floodplain values that could have substantial consequences over a wide-spread area. Location of operations could increase risk of flood loss including impacts on human safety, health, and welfare. Wetlands: The action could cause a permanent loss of wetlands across a wide-spread area. The character of the wetlands could be changed so that the functions typically provided by the wetland could be permanently lost.

		IMPACT INTENSITY DEFINITIONS		
RESOURCE AREA	**IMPACT DURATION**	**MINOR**	**MODERATE**	**MAJOR**
		terms of area and the nature of the impact. A small impact on the size, integrity, or connectivity could occur; however, wetland function could not be affected and natural restoration could occur if left alone.	Wetlands: The action could cause a measurable effect on wetlands indicators (size, integrity, connectivity) or could result in a permanent loss of wetland acreage across local and adjacent areas. However, wetland functions could only be permanently altered in limited areas.	
Air Quality and Greenhouse Gas Emissions	Short-term: During construction period. Long-term: Over the life of the project or longer.	The impact on air quality may be measurable, but could be localized and temporary, such that the emissions do not exceed the Environmental Protection Agency's (EPA's) de minimis criteria for a general conformity determination under the Clean Air Act (40 C.F.R. 93.153). The contributions to GHGs may be measurable, but below 25,000 metric ton/year of carbon dioxide (CO_2) or its equivalent. [1]	The impact on air quality could be measurable and limited to local and adjacent areas. Emissions of criteria pollutants could be at the EPA's de minimis criteria levels for general conformity determination. The contribution to GHG emissions could exceed 25,000 metric tons of CO_2 or its equivalent annually. [2] Although the level of emissions could be similar to a large source (i.e. natural gas and petroleum users, landfills, agriculture, etc.), the levels could not be a dominant contributor to GHGs in the area.	The impact on air quality could be measurable over a wide-spread area. Emissions are high, such that they could exceed the EPA's de minimis criteria for a general conformity determination. The contribution to GHGs could exceed 25,000 metric tons of CO_2 or its equivalent annually. The source could be a dominant contributor in terms of GHG in the area.

[1] "The reference point of 25,000 metric tons of direct CO2-equivalent GHG emissions may provide agencies with a useful indicator – rather than an absolute standard of insignificant effects -- for agencies' action-specific evaluation of GHG emissions and disclosure of that analysis in their NEPA documents. CEQ does not propose this reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment, as that term is used by NEPA, but notes that it serves as a minimum standard for reporting emissions under the Clean Air Act." CEQ, "Draft NEPA guidance on consideration of the effects of climate change and GHG emissions." 2010.

		IMPACT INTENSITY DEFINITIONS		
RESOURCE AREA	**IMPACT DURATION**	**MINOR**	**MODERATE**	**MAJOR**
Noise	Short-term: During construction period. Long-term: Over the life of the project.	Increased noise could attract attention, but its contribution to the soundscape would be localized and unlikely to affect current user activities.	Increased noise could attract attention, and contribute to the soundscape including in local areas and those adjacent to the action, but could not dominate. User activities could be affected.	Increased noise could attract attention, and dominate the soundscape over wide-spread areas. Noise levels could eliminate or discourage user activities.
Habitats	Short-term: Lasting less than two growing seasons. Long-term: Lasting longer than two growing seasons.	Impacts on native vegetation may be detectable, but could not alter natural conditions and be limited to localized areas. Infrequent disturbance to individual plants could be expected, but without affecting local or range-wide population stability. Infrequent or insignificant one-time disturbance to locally suitable habitat could occur, but sufficient habitat could remain functional at both the local and regional scales to maintain the viability of the species. Opportunity for increased spread of non-native species could be detectable but temporary and localized and could not displace native species populations and distributions.	Impacts on native vegetation could be measureable but limited to local and adjacent areas. Occasional disturbance to individual plants could be expected. These disturbances could affect local populations negatively, but could not be expected to affect regional population stability. Some impacts might occur in key habitats, but sufficient local habitat could retain functional to maintain the viability of the species both locally and throughout its range. Opportunity for increased spread of non-native species could be detectable and limited to local and adjacent areas, but could only result in temporary changes to native species population and distributions.	Impacts on native vegetation could be measurable and wide-spread. Frequent disturbances of individual plants could be expected, with negative impacts to both local and regional population levels. These disturbances could negatively affect range-wide population stability. Some impacts might occur in key habitats, and habitat impacts could negatively affect the viability of the species both locally and throughout its range. Actions could result in the wide-spread increase of non-native species resulting in broad and permanent changes to native species populations and distributions.
***Living Coastal and Marine Resources*:** Wildlife Species (including birds)	Short-term: Lasting up to two breeding seasons, depending on length of breeding season. Long-term: Lasting more than two breeding seasons.	Impacts to native species, their habitats, or the natural processes sustaining them could be detectable, but localized and could not measurably alter natural conditions. Infrequent responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, resting, migrating, or	Impacts on native species, their habitats, or the natural processes sustaining them could be measureable but limited to local and adjacent areas. Occasional responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, resting, migrating, or other factors affecting local population levels. Some impacts might occur in	Impacts on native species, their habitats, or the natural processes sustaining them could be detectable, and wide-spread. Frequent responses to disturbance by some individuals could be expected, with negative impacts to feeding, reproduction, migrating, or other factors resulting in a decrease in both local and range-wide population levels and habitat type. Impacts could occur during critical periods of reproduction or in key habitats and

		IMPACT INTENSITY DEFINITIONS		
RESOURCE AREA	**IMPACT DURATION**	**MINOR**	**MODERATE**	**MAJOR**
		other factors affecting population levels. Small changes to local population numbers, population structure, and other demographic factors could occur. Sufficient habitat could remain functional at both the local and range-wide scales to maintain the viability of the species. Opportunity for increased spread of non-native species could be detectable but temporary and localized and could not displace native species populations and distributions.	key habitats. However, sufficient population numbers or habitat could retain function to maintain the viability of the species both locally and throughout its range. Opportunity for increased spread of non-native species could be detectable and limited to local and adjacent areas, but could only result in temporary changes to native species population and distributions.	could result in direct mortality or loss of habitat that might affect the viability of a species. Local population numbers, population structure, and other demographic factors might experience large changes or declines. Actions could result in the wide-spread increase of non-native species resulting in broad and permanent changes to native species populations and distributions.
Living Coastal and Marine Resources: Marine and Estuarine Fauna, (fish, shellfish benthic organisms)	Short-term: Lasting up to two spawning seasons, depending on length of season. Long-term: Lasting more than two spawning seasons.	Impacts could be detectable and localized but small. Disturbance of individual species could occur; however, there could be no change in the diversity or local populations of marine and estuarine species. Any disturbance could not interfere with key behaviors such feeding and spawning. There could be no restriction of movements daily or seasonally. Opportunity for increased spread of non-native species could be detectable but temporary and localized and could not displace native species populations and distributions.	Impacts could be readily apparent and result in a change in marine and estuarine species populations in local and adjacent areas. Areas being disturbed may display a change in species diversity; however, overall populations could not be altered. Some key behaviors could be affected but not to the extent that species viability is affected. Some movements could be restricted seasonally. Opportunity for increased spread of non-native species could be detectable and limited to local and adjacent areas, but could only result in temporary changes to native species population and distributions.	Impacts could be readily apparent and could substantially change marine and estuarine species populations over a wide-scale area, possibly river-basin wide. Disturbances could result in a decrease in fish species diversity and populations. The viability of some species could be affected. Species movements could be seasonally constrained or eliminated. Actions could result in the wide-spread increase of non-native species resulting in broad and permanent changes to native species populations and distributions.
Living Coastal and Marine Resources: Protected Species	Short-term: Lasting up to one breeding/growing season.	Impacts on protected species, their habitats, or the natural processes sustaining them could be	Impacts on protected species, their habitats, or the natural processes sustaining them could be detectable	Impacts on protected species, their habitats, or the natural processes sustaining them could be detectable, wide-spread, and

		IMPACT INTENSITY DEFINITIONS		
RESOURCE AREA	**IMPACT DURATION**	**MINOR**	**MODERATE**	**MAJOR**
	Long-term: Lasting more than one breeding/growing season.	detectable, but small, localized, and could not measurably alter natural conditions. Impacts could likely result in a "may affect, not likely to adversely affect" determination for at least one listed species.	and some alteration in the numbers of protected species, or occasional responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, resting, migrating, or other factors affecting local and adjacent population levels. Impacts could occur in key habitats, but sufficient population numbers or habitat could remain functional to maintain the viability of the species both locally and throughout its range. Some disturbance to individuals or impacts to potential or designated critical habitat could occur. Impacts could likely result in a "may affect, likely to adversely affect" determination for at least one listed species. No adverse modification of critical habitat could be expected.	permanent. Substantial impacts to the population numbers of protected species, or interference with their survival, growth, or reproduction could be expected. There could be impacts to key habitat, resulting in substantial reductions in species numbers. Results in an "Is likely to jeopardize proposed or listed species / adversely modify proposed or designated critical habitat (impairment)" determination for at least one listed species.
Socioeconomics and Environmental Justice	Short-term: During construction period. Long-term: Over the life of the project or longer.	A few individuals, groups, businesses, properties or institutions could be impacted. Impacts could be small and localized. These impacts are not expected to substantively alter social and/or economic conditions. Actions could not disproportionately affect minority populations and low-income populations.	Many individuals, groups, businesses, properties or institutions could be impacted. Impacts could be readily apparent and detectable in local and adjacent areas and could have a noticeable effect on social and/or economic conditions Actions could disproportionately affect minority populations and low-income populations. However, the impact could be temporary and localized.	A large number of individuals, groups, businesses, properties or institutions could be impacted. Impacts could be readily detectable and observed, extend over a wide-spread area, and could have a substantial influence on social and/or economic conditions. Actions could disproportionately affect minority populations and low-income populations. However, the impact could be permanent and widespread.

		IMPACT INTENSITY DEFINITIONS		
RESOURCE AREA	**IMPACT DURATION**	**MINOR**	**MODERATE**	**MAJOR**
Cultural Resources	Short-term: During construction period. Long-term: Over the life of the project or longer.	Adverse impact: The disturbance of a site(s), building, structure or object could be confined to a small area with little, if any, loss of important cultural information potential.	Adverse impact: Disturbance of a site(s), building, structure or object not expected to result in a substantial loss of important cultural information.	Adverse impact: Disturbance of a site(s), building, structure or object could be substantial and may result in the loss of most or all its potential to yield important cultural information.
Infrastructure	Short-term: During construction period. Long-term: Over the life of the project or longer.	The action could affect public services or utilities but the impact could be localized and within operational capacities. There could be negligible increases in local daily traffic volumes resulting in perceived inconvenience to drivers but no actual disruptions to traffic.	The action could affect public services or utilities in local and adjacent areas and the impact could require the acquisition of additional service providers or capacity. Detectable increase in daily traffic volumes (with slightly reduced speed of travel) resulting in slowing down traffic and delays, but no change in level of service (LOS). Short service interruptions (temporary closure for a few hours) to roadway and railroad traffic.	The action could affect public services utilities over a wide-spread area resulting in the loss of certain services or necessary utilities. Extensive increase in daily traffic volumes (with reduced speed of travel) resulting in an adverse change in LOS to worsened conditions. Extensive service disruptions (temporary closure of one day or more) to roadways or railroad traffic.
Land and Marine Management	Short-term: During construction period. Long-term: Over the life of the project or longer.	The action could require a variance, zoning change or amendment to a land use or area comprehensive or management plan, but could not affect overall use and management beyond the local area.	The action could require a variance, zoning change or amendment to a land use or area comprehensive or management plan, and could affect overall land use and management in local and adjacent areas.	The action could cause permanent changes to and conflict with land uses or management plans over a wide-spread area.
Tourism and Recreational Use	Short-term: During construction period. Long-term: Over the life of the project or longer.	There could be partial developed recreational site closures to protect public safety. The same site capacity and visitor experience could remain unchanged after construction. The impact could be detectable and/or could only affect some recreationalists. Users could likely be aware of the action but changes	There could be complete site closures to protect public safety. However, the sites could be reopened after activities occur. There could be slightly reduced site capacity. The visitor experience could be slightly changed but could still be available. The impact could be readily apparent and/or could affect many recreationalists locally and in adjacent	All developed site capacity could be eliminated because developed facilities could be closed and removed. Visitors could be displaced to facilities over a wide-spread area and visitor experiences could no longer be available in many locations. The impact could affect the most recreationalists over a wide-spread area. Users could be highly aware of the action. Users could choose to pursue activities in

		IMPACT INTENSITY DEFINITIONS		
RESOURCE AREA	**IMPACT DURATION**	**MINOR**	**MODERATE**	**MAJOR**
		in use could be slight. There could be partial closures to protect public safety. Impacts could be local. There could be a change in local recreational opportunities; however it could affect relatively few visitors, or could not affect any related recreational activities.	areas. Users could be aware of the action. There could be complete closures to protect public safety. However, the areas could be reopened after activities occur. Some users could choose to pursue activities in other available local or regional areas.	other available regional areas.
Fisheries and Aquaculture	Short-term: During construction period. Long-term: Over the life of the project or longer.	A few individuals, groups, businesses, properties or institutions could be impacted. Impacts could be small and localized. These impacts are not expected to substantively alter social and/or economic conditions.	Many individuals, groups, businesses, properties or institutions could be impacted. Impacts could be readily apparent and detectable in local and adjacent areas and could have a noticeable effect on social and/or economic conditions.	A large number of individuals, groups, businesses, properties or institutions could be impacted. Impacts could be readily detectable and observed, extend over a wide-spread area, and could have a substantial influence on social and/or economic conditions.
Marine Transportation	Short-term: During construction period. Long-term: Over the life of the project or longer.	The action could affect public services or utilities but the impact could be localized and within operational capacities. There could be negligible increases in local daily marine traffic volumes resulting in perceived inconvenience to operators but no actual disruptions to transportation.	The action could affect public services or utilities in local and adjacent areas and the impact could require the acquisition of additional service providers or capacity. Detectable increase in daily marine traffic volumes (with slightly reduced speed of travel) resulting in slowing down traffic and delays. Short service interruptions (temporary delays for a few hours).	The action could affect public services utilities over a wide-spread area resulting in the loss of certain services or necessary utilities. Extensive increase in daily marine traffic volumes (with reduced speed of travel) resulting in an extensive service disruptions (temporary closure of one day or more).
Aesthetics and Visual Resources	Short-term: During construction period. Long-term: Over the life of the project or longer.	There could be a change in the view shed that was readily apparent but could not attract attention, dominate the view, or detract from current user activities or experiences.	There could be a change in the view shed that was readily apparent and attract attention. Changes could not dominate the viewscape, though they could detract from the current user activities or experiences.	Changes to the characteristic views could dominate and detract from current user activities or experiences.

		IMPACT INTENSITY DEFINITIONS		
RESOURCE AREA	**IMPACT DURATION**	**MINOR**	**MODERATE**	**MAJOR**
Public Health and Safety , Including Flood and Shoreline Protection	Short-term: During construction period. Long-term: Over the life of the project or longer.	Actions could not result in 1) soil, groundwater, and/or surface water contamination, 2) exposure of contaminated media to construction workers or transmission line operations personnel, and/or 3) mobilization and migration of contaminants currently in the soil, groundwater, or surface water at levels that could harm the workers or general public. Increased risk of potential hazards (e.g., increase likelihood of storm surge) to visitors, residents, and workers from decreased shoreline integrity could be temporary and localized.	Project construction and operation could result in 1) exposure, mobilization and/or migration of existing contaminated soil, groundwater or surface water to an extent that requires mitigation and/or 2) could introduce detectable levels of contaminants to soil, groundwater and/or surface water in localized areas within the project boundaries such that mitigation/remediation is required to restore the affected area to the preconstruction conditions. Increased risk of potential hazards to visitors, residents, and workers from decreased shoreline integrity could be sufficient to cause a permanent change in use patterns and area avoidance in local and adjacent areas.	Actions could result in soil, groundwater and/or surface water contamination, at levels exceeding federal, state, or local hazardous waste criteria including those established by 40 C.F.R. Part 261; 2) mobilization of contaminants currently in the soil, groundwater or surface water resulting in exposure of humans or other sensitive receptors such as plants and wildlife to contaminant levels that could result in health effects; and 3) result in the presence of contaminated soil, groundwater or surface water within the project area exposing workers and/or the public to contaminated or hazardous materials at levels exceeding those permitted by Federal Occupational Safety and Health Administration (OSHA) in 29 C.F.R. Part 1910. Increased risk of potential hazards to visitors, residents, and workers from decreased shoreline integrity could be substantial and could cause permanent changes in use patterns and area avoidance over a wide-spread area.

Appendix E. Statements of Findings Related to DOI Bike and Pedestrian Use Enhancement Project at Gulf Islands National Seashore

National Park Service
U.S. Department of the Interior

Gulf Island National Seashore
Davis Bayou Area Ocean Springs, Mississippi

STATEMENT OF FINDINGS
FOR
EXECUTIVE ORDER 11900 (PROTECTION OF WETLANDS)

Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore: Project Description; PMIS 176842

Recommended:

Superintendent, Gulf Island National Seashore

Certification of Technical Adequacy and Service-wide Consistency

Chief, Water Resources Division

Approved:

Director, Southeast Region

Wetlands Statement of Findings

INTRODUCTION

Much of the vegetation between The Gulf of Mexico and the uplands at Gulf Islands National Seashore is considered tidal marsh. According to NPS Director's Order 77-1, the wetlands procedural manual, the National Park Service adheres to the Cowardin et al. 1979 wetlands classification scheme. In the Mississippi District, the hydraulic conditions of some wetlands in areas of Davis Bayou are dammed or blocked by roadways and culverts, resulting in the unnatural ponding, disruption of tidal exchange, and/or retention of water. The National Park Service adheres to a "no net loss" of wetlands policy, as well as other federal and agency policies. This statement of findings has been prepared in accordance with Executive Order 11990 (Protection of Wetlands) and NPS Director's Order #77-1.

PROPOSED ACTION

The proposed Bike and Pedestrian Use Enhancements project involves improving the experience of bicyclists and pedestrians on Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore (Figure 7-3 of Chapter 7). Park Road and Robert McGhee Road are both two-lane roads with no shoulders. Park Road was constructed over 30 years ago to serve as the primary access to the William M. Colmer Visitor Center. In the past 20 years, approximately 10,000 additional residents have moved into Ocean Springs. As development has increased, neighboring residents have increasingly driven through the Davis Bayou Area as a shortcut to other destinations. Park Road offers an overpass over the railroad line that motorists use to avoid temporary blockages by passing trains. This road also provides a shorter route to many residences.

Robert McGhee Road (Route 016), previously known as Hanley Road, provides access to the Davis Bayou campground and public use boat dock. Robert McGhee Road also connects to a bicycle trail route that extends to Halstead Road, located outside of the park. A portion of the Live Oak Bicycle Trail, a 15.5-mile route within the city of Ocean Springs, also traverses through the Davis Bayou Area along Robert McGhee Road.

Members of the public use these roads as walking, jogging, bicycling, and motor vehicle traffic routes. Motorists are known to drive excessive speeds that place non-motorized visitors at risk. The simultaneous use of the roads by all user groups results in a high probability for accidents, visitor conflicts, and potentially unsafe conditions for pedestrians, bicyclists, and motorists. Pedestrians and bicyclists using the road corridors within the Davis Bayou Area have limited space to maneuver to avoid approaching motorists, as there is little room beyond the edge of the road to traverse. Additionally, wetland areas adjacent to the roadway minimize the extent to which pedestrians and bicyclists can negotiate off-road to avoid collisions with motorists. Motorized traffic also poses risks to park wildlife. High speeds of the motor vehicles increases the number of wildlife collisions on Park Road and Robert McGhee Road.

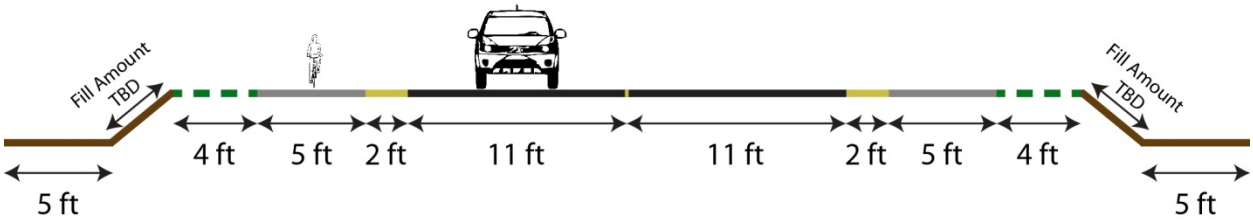
Preferred Alternative

The exact project schedule and design for the Preferred Alternative (Alternative B in the EA) is currently unknown. Construction is expected to begin in fall of 2016 and continue into spring 2017. Only the 2.17-

mile Park Road portion of this project is being funded as this Phase IV early restoration project. The 0.82-mile portion on McGhee Road will be funded – and constructed – separately, but is included here and in the Environmental Assessment as a "connected action."

The new road configuration would widen the existing roadway from 22 foot (ft) to up to 36-ft paved surface that includes two 11-ft motor vehicle lanes flanked by 2-ft buffers and 5-ft multiple-use lanes (as depicted in the diagram below). There would also be 4-ft non-paved shoulders flanking the multiple use lanes. Beyond the non-paved shoulders, construction would also include fill in areas, plus 5 additional feet of clearing (as depicted in the diagram below). Retaining walls could also be constructed in areas where the road is elevated higher than the surrounding landforms.

The study corridor for this project includes 50 feet from the edge of the paved surface along Park Road and Robert McGhee Road. Therefore, the total width of the study corridor is 122-ft wide. However, where Park Road and Robert McGhee Road cross east Stark Bayou and Stark Bayou, respectively, the study corridor is narrower. This is because, compared to the non-tidal-marsh areas, the road is not as high relative to the adjacent landscape and the elevations of road and tidal marsh are much more uniform (flat). As such, the width will be narrower in the tidal marsh than in non-tidal-marsh areas and it's easier to predict a maximum width for the project as it goes through the tidal marsh. This total width is 74 ft (26 ft out from each side plus the 22-ft wide road). The boundaries of the study corridor are considered to be the limits of construction.



Under this alternative, project construction activities could include:

- excavating, grading, filling, and overlaying asphalt to widen the existing paved surface from 22-ft up to 36-ft paved surface with additional 4 ft non-paved shoulders, with appropriate striping;
- ground disturbance beyond the existing asphalt and up to 14 additional feet of asphalt proposed, 8 feet of non-paved shoulders, plus 5 feet from the toe of slopes (in palustrine areas only, not tidal marsh) for construction and heavy equipment maneuvering, thus widening the existing road corridors;
- placing and compacting fill adjacent to roadway including wetland areas;
- installing two traffic-calming medians (e.g., 10-ft wide ellipses) within the first mile of Park Road, similar to the entrance median;
- installing retaining walls along the road in areas where the road is elevated higher than the surrounding land forms;
- installing new or extending several existing culverts;
- removing woody vegetation and mature trees;

- planting native grasses on non-paved shoulders and grasses/trees on bare slopes or in new medians;
- constructing replacement boardwalks over portions of Stark Bayou on Robert McGhee Road, using cantilevers and pilings, with clearance for under-boardwalk wildlife crossings, or replacing the boardwalk with fill for the multiple use lane;
- replacing existing culvert bridge on Park Road over East Stark Bayou with a 20-foot-wide bottomless box culvert or small bridge, with restoration of water flow of wetlands on both sides of the road at culvert location, and possibly eliminating the existing cantilevered boardwalk on the west side of the road;
- conducting wetlands compensatory mitigation activities, consisting of prescribed burns (NPS 2009);
- avoiding most existing utilities and possible relocating some existing utilities, where needed, (e.g., light poles, cable and phone lines, water hydrants, buried electrical lines and transformers);
- relocating/replacing road signs;
- relocating/replacing guardrails to meet current standards;
- installing park entrance sign at VFW Road;
- relocating park entrance sign at U.S. Route 90;
- Equipment likely to be used includes: track hoes, back hoes, graders, dump trucks, compactors, asphalt pavers, and road striping equipment;
- One lane will likely remain open during the project implementation except for occasional brief closures of both lanes as needed.

Other Alternatives Considered

Under the No-Action Alternative (Alternative A in the EA), the National Park Service would continue to use and maintain the existing configuration (i.e., two 11-foot [ft] one-way lanes with no paved shoulder) of Park Road and Robert McGhee Road within the Davis Bayou Area of the park. There would be no changes to NPS maintenance, enforcement, and operating activities and no anticipated changes to traffic levels or community and visitor use. Alternative A represents a continuation of the existing condition and provides a baseline for evaluating impacts of the action alternatives.

Under Alternative C of the associated Environmental Assessment, the existing configuration of Park Road and Robert McGhee Road would remain at the current width. A gate would be installed at the intersection of Knapp and VFW Roads. During times of high recreational use on Park Road, VFW Road would be closed to motorists. Proposed closure times would be from 4pm-7pm Monday-Friday and 8am-12pm Saturday. This alternative would substantially reduce the number of motor vehicles present on the mile of Park Road between U.S. Route 90 and VFW Road during high recreational usage times. The gate would permit emergency vehicles to pass through at all hours. There would be no change to the access point off of U.S. Route 90. A sign would be posted at the U.S. Route 90 entrance and Government Street / Knapp Road Intersection indicating timed closures of VFW Road.

Neither the No Action Alternative nor Alternative C would solve the safety and visitor experience concerns as effectively as the Preferred Alternative. Under the No Action Alternative, the existing safety concerns along Park Road and Robert McGhee Road would remain. Under Alternative C, the pedestrians, bicyclists, and motorists would still share the same space on Park Road and Robert McGhee Road. The number of intersections between user groups would be reduced under this alternative, but the interactions would still occur. Under the Preferred Alternative, pedestrians and bicyclist would be separated from the motor vehicle lanes, creating a safer and more visitor-friendly experience in the Davis Bayou Area.

BRIEF SITE DESCRIPTION

Gulf Island National Seashore encompasses barrier islands and coastal mainland in Mississippi and Florida and consists of 12 separate units stretching along 160 miles from Cat Island in Mississippi to the eastern end of Santa Rosa Island in Florida. The Davis Bayou Area of Gulf Islands National Seashore is located in Ocean Springs, Jackson County, Mississippi (see Figure 7-1 of the EA).

WETLANDS DELINEATION AND IMPACTS

In December 2013, wetlands scientists with the assistance of personnel from the Gulf Islands National Seashore Science and Resources Stewardship Division and the Southeast Regional Office conducted field delineations of wetland features within a 50-ft buffer of the proposed project area (Figure 1). Due to concerns of some NPS wetlands not being included in the original delineation in December 2013, another delineation occurred in March 2015 to complete the delineation. The wetlands delineation was conducted in accordance with the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987), Regional Supplement to the U.S. Corps of Engineers Wetlands Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0), and the National Park Service Procedural Manual #77-1: Wetland Protection (National Park Service, 2012).

Wetland boundaries were determined by evaluating the presence or absence of wetland indicators at two or more “observation points” (OP). The boundary was mapped between an OP evaluated as an upland location and an OP evaluated as a wetland. Delineated wetlands were identified using the Cowardin classification system (Cowardin et al. 1979). Under this classification, the wetlands present in the Davis Bayou Area were placed into estuarine (non-oceanic wetlands influenced by tidal flows) emergent, palustrine (fresh water wetland systems) emergent, palustrine scrub shrub, and palustrine forested.

The field delineation efforts mapped 7.3 acres of wetlands within the 50-ft of the existing Park Road and Robert McGhee Road – i.e., the 122-ft limits of construction for the palustrine emergent, palustrine scrub-shrub, and palustrine forested wetlands and the 74-ft limits of construction for the estuarine intertidal emergent wetlands. Table 1 depicts the amount of wetlands delineated in the limits of construction by Cowardin classification.

Table 1. Wetland amounts by Cowardin classification within the limits of construction.

WETLAND CLASSIFICATION	AREA IN 122-FT AND 74-FT LIMITS OF CONSTRUCTION
Estuarine Intertidal Emergent (E2EM1)	0.69 acres
Palustrine Emergent (PEM1)	0.4 acres
Palustrine Scrub-Shrub (PSS1)	0.1 acres
Palustrine Forested (PFO1 & PFO4)	6.1 acres

The construction of multiple use lanes would adversely affect wetlands adjacent to the proposed project area in Davis Bayou. The boundaries of the wetlands extend outside the 122-ft and the 74-ft limits of construction. The areas that extend outside the limits of construction are similar in biological and physical characteristics as the areas delineated in the limits of construction. Therefore, tidal marsh is present beyond the limits of construction where estuarine emergent wetlands were identified and wet pine flatwoods are present beyond the limits of construction where palustrine forested wetlands were identified. The Davis Bayou Area is estimated to have approximately 164 acres of wetlands and 120 acres of bayou (NPS 2000).

Wetland habitat types delineated include tidal marshes (salt and brackish) located along tidal bayous, bayhead swamps that constitute the upper reaches of small drainage systems, wet pine savannas located within flat, poorly drained sites, and transitional wet forest located on the sloping wet soil areas between tidal marsh and adjacent upland areas. The acreage of each of these types of wetland found in the Davis Bayou Area is presented in Table 2.

Table 2. Acreage of Wetland Types present in the Davis Bayou Area.

WETLAND TYPE	AMOUNT IN DAVIS BAYOU AREA
Tidal Marsh (E2EM1)	52 acres
Bayhead Swamp (PFO1)	20 acres
Wet Pine Savanna (PFO4)	74 acres
Transitional Wet Forest (PFO1)	18 acres
Source: NPS 2000	

Tidal Salt Marshes

The salt marsh community (E2EM1) in the Davis Bayou Area is comprised of the three arms of Davis Bayou. Within the limits of construction, the tidal salt marshes are East Stark Bayou crossed by Park Road, and Stark Bayou crossed by Robert McGhee Road. These estuarine emergent wetlands are composed of wet and salt tolerant grasses and sedges growing along the fringe of intertidal flats that are exposed to the ebb and flow of the daily fluctuating ocean tides. This community occurs in relatively

protected niches and drainage basins and creates a transition from open water to the emerging land. Because this vegetation community must tolerate daily flooding and saline conditions, relatively few species grow in this environment, and the subtypes or zones within this community are often composed of nearly pure stands of a single species (NPS 2014). 52 acres of tidal marsh is present in the Davis Bayou Area (NPS 2000).

Palustrine Forested Wetlands

Bayhead swamps (PFO1 & PFO4) occur on mucky silt loams within the Davis Bayou Area. These areas are forested wetlands found at or near the heads of smaller tributaries of large drainage basins or as the main part of smaller or local drainage systems. These wetlands drain quickly following rains. Commonly occurring trees include sweet bay magnolia, swamp black gum (*Nyssa biflora*), red bay (*Persea palustris*), red maple (*Acer rubrum*), slash pine (*Pinus elliioti*), and sweetgum (*Liquidambar styraciflua*). Common shrubs include wax myrtle, large gallberry (*Ilex coriacea*), and swamp titi. The ground or herb layer commonly consists of cinnamon fern (*Osmunda cinnamomea*), royal fern, netted chain fern (*Woodwardia areolata*), lizard's tail (*Saururus cernuus*), sphagnum moss (*Sphagnum* spp.), with occasional grasses and sedges. This habitat typically drains almost completely after rain events. Fire has been excluded as a management approach in these areas for approximately 80 years. Fire is not an apparent controlling factor in this habitat type, occurring only in dry conditions. Soils are hydric, composed primarily of sand with varying smaller amounts of silt and clay (NPS 2014).

Wet pine savannas are open grasslands with scattered pines that occur on poorly drained, flat terraces of the lower coastal plain region of the southeast. This habitat belongs to a broad group of pine-dominated forests referred to as "flatwoods" that include pine flatwoods, southern mixed hardwood forest, and longleaf pine-turkey oak forest. In the limits of construction within the Davis Bayou Area, this habitat can be found north of Park Road between VFW Road and Gollott Avenue. As with all flatwood habitat types, longleaf pine is the dominant tree, and a periodic fire (three- to five-year cycle) helps to maintain this and numerous other fire-adapted species. Trees are typically widely spaced or absent in the wettest sites. In absence of fire, slash pine may become more dominant and, along with shrubs, create a dense canopy that limits understory vegetation. Although large individual slash pines can survive "cool" ground fires, this species does not have a fire resistant "grass" stage like the longleaf pine. Under natural conditions of periodic fire, longleaf pine is the only common tree species that thrives. In the absence or suppression of fire, slash pine, red maple, sweet bay magnolia, and red bay may become more common, as well as shrubs like common gallberry (*Ilex glabra*), large gallberry, yaupon, wax myrtle, and swamp titi (NPS 2014).

Transitional wet forests occupy a zone of transition from one habitat type to another. In the case of Davis Bayou, this community occupies the wet soil slopes between upland ridges and Davis Bayou intertidal areas. In the limits of construction these areas are palustrine wetlands found along the perimeter of the estuarine emergent wetlands at the Robert McGhee Road crossing of Davis Bayou. This habitat designation was recognized to account for the wet soil areas delineated up slope of the adjacent tidal marshes that were clearly not affected by the normal tidal action. Groundwater seeping from the upland ridges is the apparent source of water responsible for the wet soil conditions. Although similar to bayhead swamps in general characteristics, this habitat type can also include vegetation found in the

adjacent mixed hardwood forest. The effect of fire in this habitat is unknown. Although similar to bayhead swamps in vegetation and soil characteristics, the upland proximity to fire-susceptible southern mixed hardwood forest may expose them to periodic fire. As with bayhead swamps, these habitats may support fire only under dry conditions (NPS 2014).

Direct loss of functionality would occur to those wetlands where fill would be added for construction of the new multiple use lanes. The area of wetlands impacted could be up to 7.3 acres (Table 1). Long-term, minor, adverse direct impacts are expected to fish and wildlife due to the permanent loss of habitat from removal of vegetation. The ability for these wetlands to retain stormwater and recharge ground water would be reduced. Fishing does occur near the culverts under Park Road at East Stark Bayou and under Robert McGhee Road at Stark Bayou. Short-term minor impacts would occur to this recreational opportunity during construction. The impacts described above to the biological, hydrologic, and recreation values of the wetlands would be minor. Approximately 155 acres of wetlands with similar functionality would still be present at the Davis Bayou Area providing habitat for displace wildlife, providing stormwater storage and ground water recharge, and recreational opportunities.

Implementation of the Preferred Alternative is not expected to have adverse impacts to chemical geomorphological, cultural, or aesthetic characteristics of the wetlands found in the Davis Bayou Area.

For the in-water portion of this project, the proposed discharge of dredged or fill material into waters of the United States, including wetlands, or work affecting navigable waters associated with this project will continue to be coordinated with the USACE pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). The Mobile Corps District was contacted in 2014 for a preliminary discussion of the permitting process. Continued coordination with USACE and final authorization pursuant to CWA/RHA will be completed prior to project implementation once final design is completed.

FUNCTIONAL ANALYSIS

A modified Wetland Evaluation Technique (WET) method was used to assess functional criteria. Under this method, 11 functions and values are assessed. These criteria include: groundwater re-charge or discharge potential, flood flow alteration, sediment stabilization, sediment/toxicant retention, nutrient removal/transformation, production export, wildlife habitat assessment, plant habitat assessment; aquatic habitat assessment, recreation, and uniqueness/heritage values (Adamus et al. 1987, Adamus et al. 1991, USACE 2001). To evaluate functional value using the WET method, not all criteria need to be used (USACE 2001).

In order to more effectively and efficiently assess functional value of the wetlands in the limits of construction at Davis Bayou, the wetlands were evaluated according to their Cowardin classification. The four classifications used are depicted in Figure 2 through Figure 7.

For the purposes of the wetland delineation and assessment performed on wetlands in the Davis Bayou Area of Gulf Islands National Seashore, some of the criteria considered in the WET method were grouped into larger categories to assess functional values. For instance, wildlife habitat assessment, plant habitat assessment, and aquatic habitat assessment criteria were grouped into a “natural communities functional values” category based on the quality of habitat provided. Similarly,

groundwater recharge potential, groundwater discharge, sediment stabilization, sediment/toxicant retention potential, and nutrient removal/transformation potential were grouped into a "water quality/hydrological functional values" category. The qualitative functional assessment of the wetlands identified in this report is provided in Table 3 and Table 4.

For the natural communities functional values category, the functions were rated as "high" if the wetland supported diverse habitats with high vegetation diversity and could support foraging or reproductive habitat. A "medium" rating was applied for wetlands with more than one habitat with some vegetation diversity, and a "low" was applied to wetlands with a monotypic vegetation stand and low habitat diversity.

For the water quality/hydrological functional values category, a "high rating" was applied when the wetland appeared to have undisturbed hydrological functions and supported features that are associated with maintaining or enhancing water quality and bank stabilization functions. A "medium" rating was applied when the functions appeared to be altered, and a "low" rating was applied when the functions were absent or highly degraded.

JUSTIFICATION FOR THE USE OF WETLANDS

The proposed Bike and Pedestrian Use Enhancements project involves improving the experience of bicyclists and pedestrians on Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore. The existing road transects the wetlands mentioned in this document already and cannot be re-routed without extreme expense and would still have a footprint within these wetlands. The preferred alternative utilizes the existing road to improve safety for bicyclists and pedestrians, with the addition of additional space alongside the existing roadway.

The proposed project is needed for the following reasons:

- The use of Park Road and Robert McGhee Road by pedestrians, bicyclists, and motorists results in visitor conflicts and potential unsafe operations for all three user groups;
- The preferred alternative would provide a separate, safer area for pedestrians and bicyclists to use that would reduce the interactions with motor vehicles. This alternatives is expected to improve safety and visitor experience of pedestrians, bicyclists, and motorists;
- Traffic on Park Road has increased by approximately 500 cars a day since the 2010 installation of a traffic light at the US Route 90 intersection raising safety concerns;
- The road corridor does not have a shoulder and therefore, there is limited space for pedestrians and bicyclists to maneuver to avoid approaching motorists;
- Adjacent wetlands minimize the extent to which pedestrians and bicyclists are able to negotiate off road attempts to avoid collisions with motorists;
- Future development, including on private properties whose only road access is via Park Road, is expected to increase the traffic on Park Road;
- Wildlife collisions on Park and McGhee Road occur frequently, and the reduction in speed of motor vehicles would reduce these collisions;

MITIGATION

During the alternatives development process, an alternative was proposed to construct a multiple-use trail completely separate from the Park Road and Robert McGhee Roads. Due to the added impacts this alternative would have had to wetlands, it was not considered for detailed analysis in the environmental assessment. By constructing the multiple-use lanes adjacent to the existing roadways, the NPS will be avoiding wetlands by using areas that have been previously filled to the extent possible. Wetland avoidance will also be taken into consideration during the design of the multiple-use lanes.

COMPENSATORY MITIGATION PLAN

There are two types of wetlands that are expected to be impacted and require mitigation:

1) Palustrine Wetlands: The extent of impacts to palustrine wetlands is expected to be 6.6 acres. Fill would be added to these wetlands. The mitigation plan includes prescribed burns of wetland areas outside the limits of construction at Davis Bayou to mitigate for loss of function to 6.1 acres of palustrine forested wetland, 0.4 acre of palustrine emergent wetland, and 0.1 acre of palustrine scrub-shrub wetland (Figure 8). Areas proposed as mitigation areas have some of the only pitcher plants, including parrot beak and sundew, within the Davis Bayou Area. Many of the wetland areas at Davis Bayou have extremely thick understory of loblolly pine saplings, sweetgum saplings, swamp titi, green briar, wax myrtle, and red maple. This understory limits the regeneration of the longleaf pine, and limits the availability of longleaf pine savannahs that were once prevalent in the area. Prescribed burns will help to remove the thick understory, promote ecosystem sustainability, allow for longleaf pine regeneration, allow pitcher plants to thrive, and improve the biological functional value of the existing wetlands.

   Compensatory mitigation is proposed to occur in the area north of Park Road between Robert McGhee Road and VFW Road. This area consists of 60 acres, of which 29 acres was delineated as wetland in 2000 (NPS 2000) (Figure 9). The ratio of wet pine savannah impacts to compensation is approximately 1:4 (i.e., 6.6:29). Once the construction schedule is finalized, a burn plan will be designed. The prescribed burn will occur during late winter or early spring on a 3 to 5 year cycle in perpetuity. The biological habitat in the area would benefit from the prescribed burn immediately due to the removal of understory. Germination of certain plant species (e.g., long-leaf pine) would be expected to occur during the following years as natural succession is restored. No monitoring or maintenance is currently planned. Funding for this compensatory mitigation would be provided as part of the costs associated with the proposed action.

2) Estuarine Intertidal Emergent Wetlands: The impacts to estuarine wetlands will be 0.69 acres. Fill would be added to estuarine intertidal wetlands. The mitigation being proposed for these impacts is to improve the hydrologic regime to East Stark Bayou east of Park Road by replacing the existing 3 ft x 3 ft concrete box culvert under Park Road with a 20'-wide bottomless culvert similar to the one currently in place under Robert McGhee Road at Stark Bayou. The current culvert and roadbed is a bottleneck to both the free sheet flow of water and the free movement

of fish, wildlife, and aquatic organisms between the 4.95-acre area east of Park Road and the rest of Stark and Davis Bayous (see Figure 9). Improving the natural flow by installing a bottomless culvert would improve wetland habitat east of Park Road by improving water quality and water levels by increasing both the degree and the rate of exchange of water in/out of this area. Restoring the free movement of fish, wildlife, and aquatic organisms would improve wetland habitat east of Park Road by allowing a much greater and more natural interaction of fauna with the physical and floral components of that habitat, thus helping shape it and improve it. Additionally, during tropical storm events, the road frequently is underwater and stormwater movement if often restricted by the existing culvert. The new bottomless culvert would lessen the opportunities for stormwater to inundate the road (Figure 9) Improvement of the hydrologic regime of the wetland would be seen immediately after the culvert has been replaced – sometime around spring, 2017. However, improvements to the function of providing biological habitat would be gradual with changes seen over the following 2-5 years. Maintenance to the culvert would be provided as regular road maintenance. Funding for this mitigation would be provided as part of construction costs associated with the proposed action.

In addition to replacing the culvert under Park Road as part of wetland mitigation, mitigation is also being proposed for essential fish habitat effects. NPS would create approximately one acre of intertidal marsh as required mitigation for essential fish habitat effects in one or two areas shown in Figure 8. Details such as final elevations of created marsh terraces and exact methodology will be determined later during the engineering and design phase of project implementation, as will exact locations of areas that would be dredged. However, some methodology can be prescribed now. For marsh elevations, adjacent healthy marsh will be surveyed and a compaction curve will be developed in order to determine the initial elevations that will be needed so that proper marsh elevations will result after compaction and dewatering occurs. Containment dikes will be used during marsh creation to force the sediments to "stack" properly. These dikes will be breached once sediments have consolidated and revegetated sufficiently; this will ensure that proper tidal circulation is restored in this area. Additionally, efforts to create a tidal creek within the mitigation area to improve biological productivity will be identified during engineering and design. A small "section dredge" will be used to undertake this work, but a "bucket dredge" will be needed to create the containment dikes.
Planting Plan details will be determined before mitigation is implemented; however, some details can be prescribed now. Plant material will be purchased from nurseries and will be planted on no greater than six-ft centers. Only species and forms (e.g., sprigs, bare roots, plugs, gallon containers) that are appropriate for the sites will be planted. Plant material will meet the required genetic specifications. Planting will occur after the dredged material has had time to consolidate sufficiently (approximately three months). Performance criteria include: 1) having 80% or more of the created marsh to be within six inches of the desired elevation one calendar year and three calendar years after placement; 2) having at least 75% vegetative coverage one year after planting and 90% or higher coverage within three years. Vegetative coverage assessments will be designed later, but would involve something in the range of 20 two-meter randomly distributed plots over the one-acre area. Photo-monitoring of plots should also occur

and any use of the area by animals would be reported. Taking into account, then, the marsh creation and the culvert replacement mitigation, the total ratio of impacted area to mitigated area is approximately 1:8.6 (i.e., 0.69:5.95).

Additionally, best management practices will be implemented during construction to help reduce impacts to wetlands during construction. These Best Management Practices include:

- Buffers between areas of soil disturbance and wetlands or waterways would be planned and maintained;
- Soil erosion best management practices such as sediment traps, erosion check screen filters, and hydro mulch to prevent the entry of sediment into wetlands would be used;
- Any hazardous waste that is generated in the project area would be promptly removed and properly disposed of;
- Equipment would be inspected for leaks of oil, fuels, or hydraulic fluids before and during use to prevent soil and water contamination. Contractors would be required to implement a plan to promptly clean up any leaks or spills from equipment, such as hydraulic fluid, oil, fuel, or antifreeze;
- Onsite fueling and maintenance would be minimized. If these activities could not be avoided, fuels and other fluids would be stored in a restricted/designated area, and fueling and maintenance would be performed in designated areas that are bermed and lined to contain spills. Provisions for the containment of spills and the removal and safe disposal of contaminated materials, including soil, would be required;
- Actions would be taken to minimize effects on site hydrology and fluvial processes, including flow, circulation, water level fluctuations, and sediment transport. Take care to avoid any rutting caused by vehicles or equipment;
- Measures would be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering wetland areas. Action would be consistent with state water quality standards and Clean Water Act Section 401 certification requirements;
- Appropriate erosion and siltation controls would be maintained during construction;
- Fill material would be properly maintained to avoid adverse impacts on aquatic environments.

SUMMARY

The NPS finds that the proposed Bike and Pedestrian Use Enhancements project improving the experience of bicyclists and pedestrians on Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore are essential for ensuring the safety of park visitors. The NPS also finds that there are no practicable alternatives to constructing the multiple use lanes. The proposed action will impact a total of 6.6 acres palustrine emergent, scrub-shrub, and forested wetland in the 122-ft-wide limits of construction, and a total of 0.69 acres of estuarine intertidal emergent wetland in the 74-ft-wide limits of construction. Compensatory mitigation for the loss of the 6.6 acres of palustrine wetlands will be compensated by introducing prescribed burn vegetation enhancement of 29 acres of palustrine forested wetland on a 3 to 5 year cycle. Compensatory mitigation for the loss of 0.69 acres of estuarine habitat will occur with 1) both the improved intertidal exchange (via the installation of a large

box culvert under the road) and the greater movement of fauna between the Davis Bayou side of Park Road and the 4.95-acre marsh area just east of Park Road; and 2) the creation of approximately one acre of intertidal marsh.

Mitigation and compliance with regulations and policies to prevent impacts to wetlands and water quality would be strictly adhered to during and after construction. Permits with other federal and state agencies would be obtained prior to construction activities.

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Table 3: Wetlands Functional Assessment Rating for Wetland Characteristics

Wetland Classification	Biological	Chemical	Hydrologic	Geomorpho-logical	Recreational	Cultural	Aesthetic
Estuarine Intertidal Emergent	High	Low	High	Low	Med	Low	Low
Palustrine Emergent	High	Low	Medium	Low	Low	Low	Low
Palustrine Scrub/Shrub	Low	Low	Medium	Low	Low	Low	Low
Palustrine Forested	High	Low	Medium	Low	Low	Low	Low

Table 4: Detailed Functional Assessment of the Biological and Hydrological Values of Affected Wetlands

Delineated Wetlands	Natural Communities Functional Values	Water Quality / Hydrological Functional Values	Rating
Estuarine Intertidal Emergent	Habitat for tidal aquatic species, American alligator, fishes, and birds. Shallow areas have emergent vegetation. Open water areas present.	Sediment retention, obstruction of storm surge, shoreline stabilization.	Habitat functions rating: **"high"** Water quality/hydrological functions rating: **"high"** ***Overall rating: "high"***
Palustrine Emergent	Freshwater shallow lentic habitat for aquatic mammals, amphibians, fishes, and reptiles including the American alligator. Shallow areas have emergent vegetation. Open water areas present.	Sediment retention, water storage and delay (subsurface and surface).	Habitat functions rating: **"high"** Water quality/hydrological functions rating: **"medium"** ***Overall rating: "medium"***
Palustrine Scrub/Shrub	Habitat for aquatic reptiles and amphibians, and high plant diversity.	Sediment retention, water storage and delay (subsurface and surface).	Habitat functions rating: **"medium"** Water quality/hydrological functions rating: **"medium"** ***Overall rating: "medium"***
Palustrine Forested	High plant diversity. Dense understory in many areas provides habitat for small mammals, mesopredators, and birds.	Minimal water storage and delay (subsurface).	Habitat functions rating: **"high"** Water quality/hydrological functions rating: **"low"** ***Overall rating: "medium"***

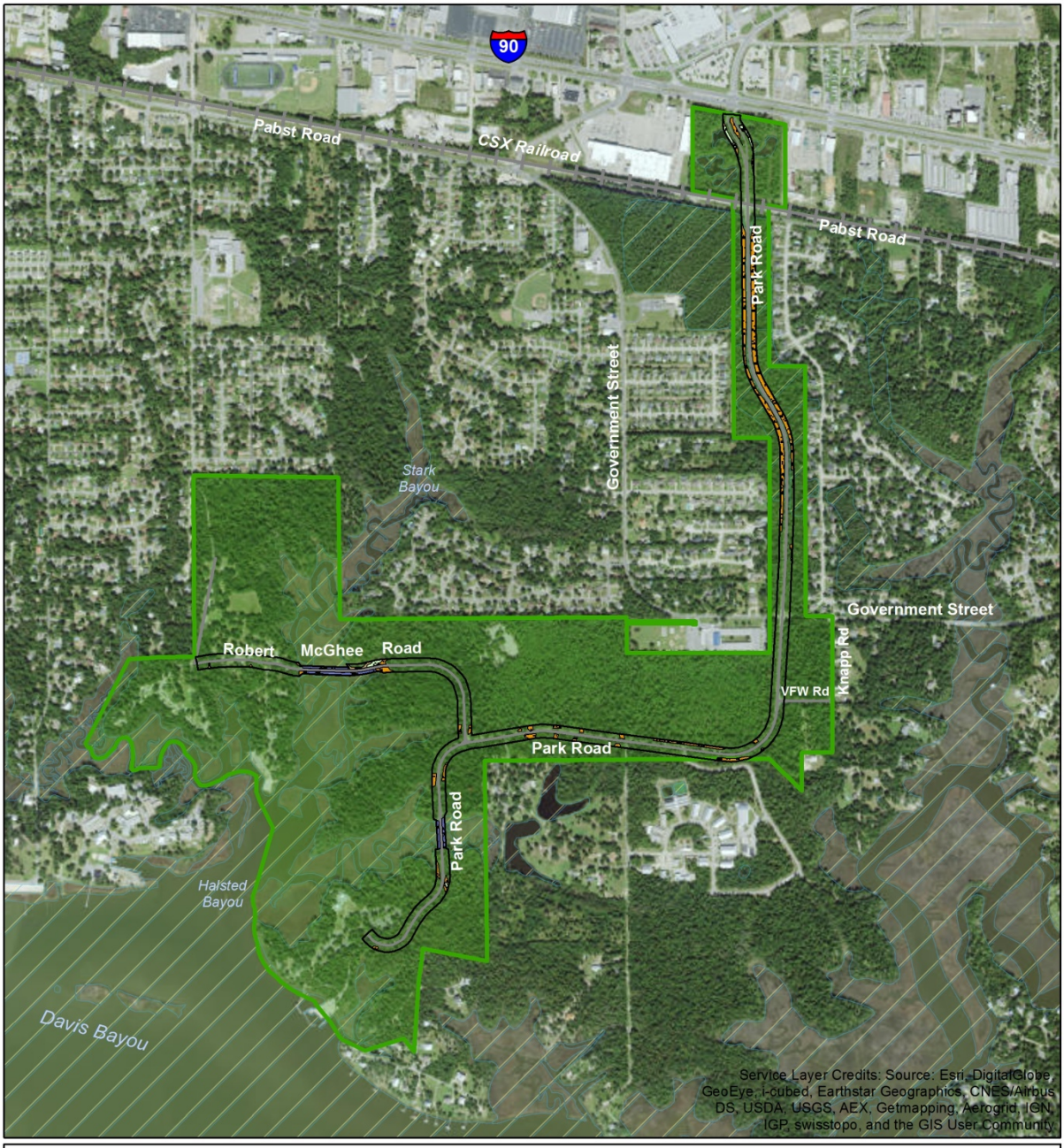
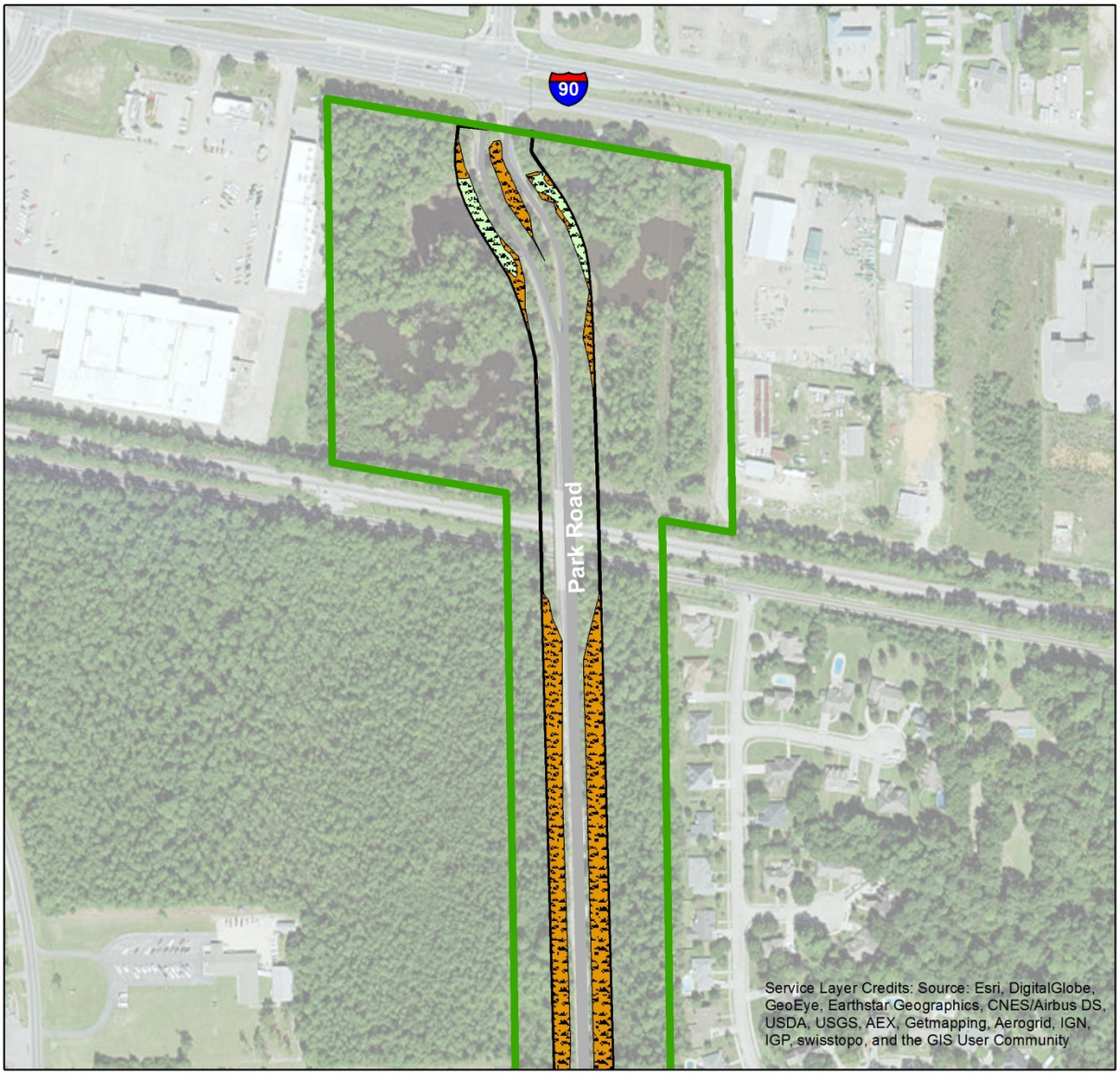


Figure 1: Project Area Wetlands within the Study Corridor Gulf Islands National Seashore

U.S. Department of Interior/ National Park Service



North

0 125 250 500 Feet

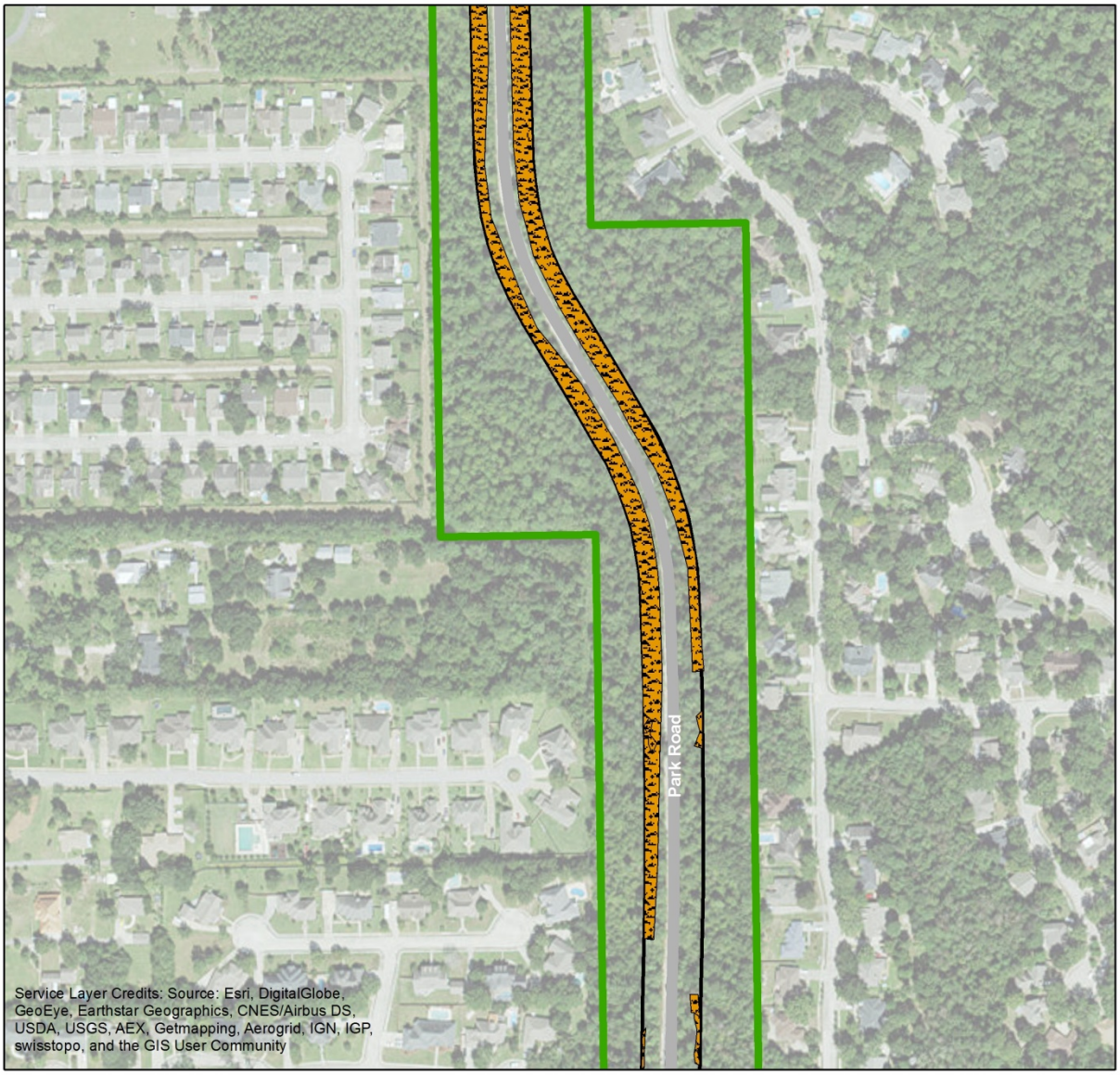
Area of Detail

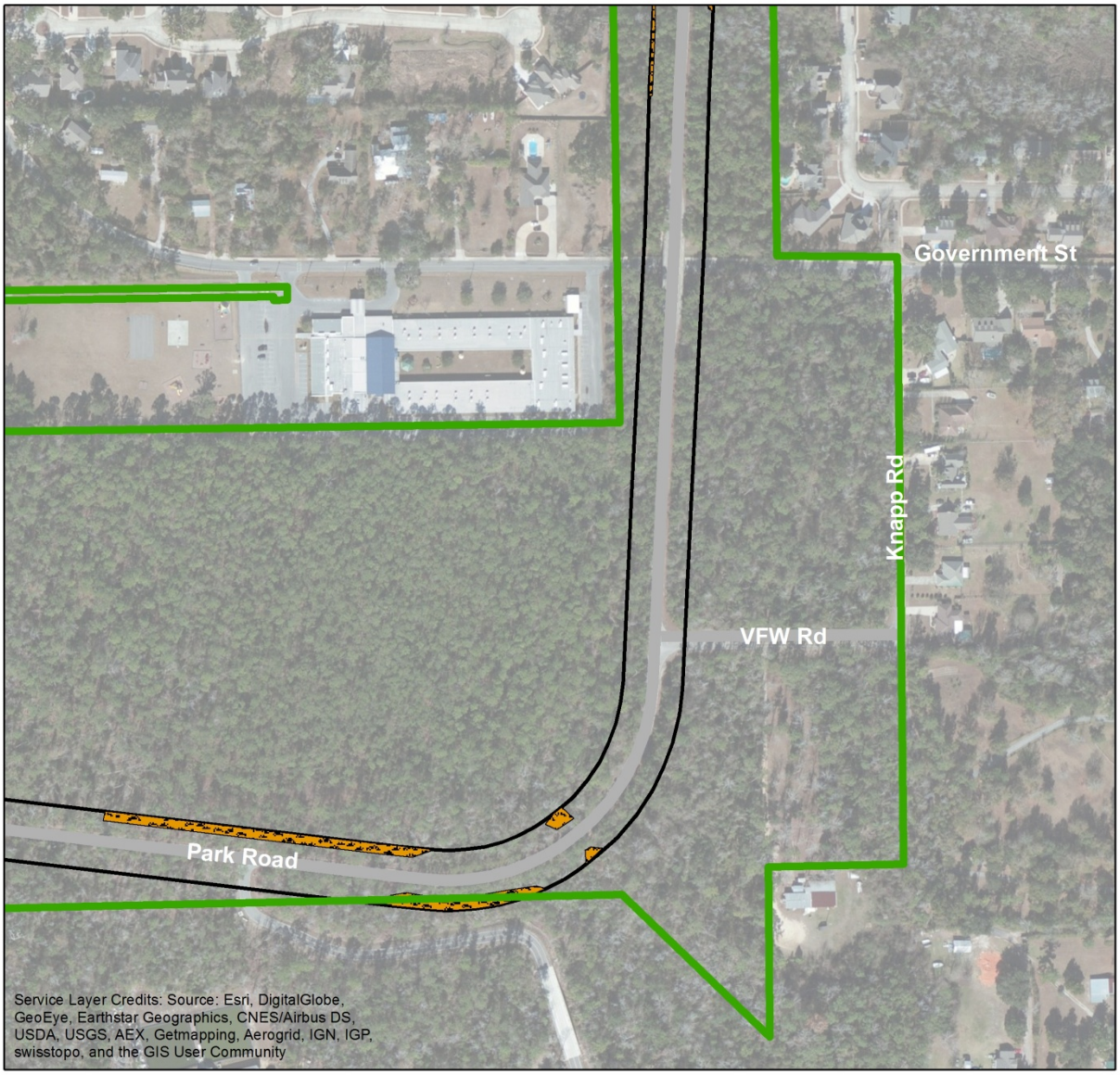
Figure 2: Wetlands by Cowardin Classification within the Study Corridor Gulf Islands National Seashore

U.S. Department of Interior/ National Park Service

Legend

- Estuarine Emergent
- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub
- Study Corridor
- Project Area Boundary


Park Road
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
North
0 125 250 500 Feet
Figure 3: Wetlands by Cowardin Classification within the Study Corridor Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service
Legend
Estuarine Emergent
Palustrine Emergent
Palustrine Forested
Palustrine Scrub-Shrub
Study Corridor
Project Area Boundary



North

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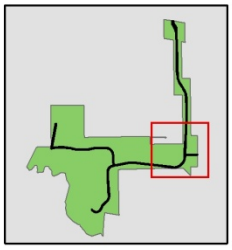
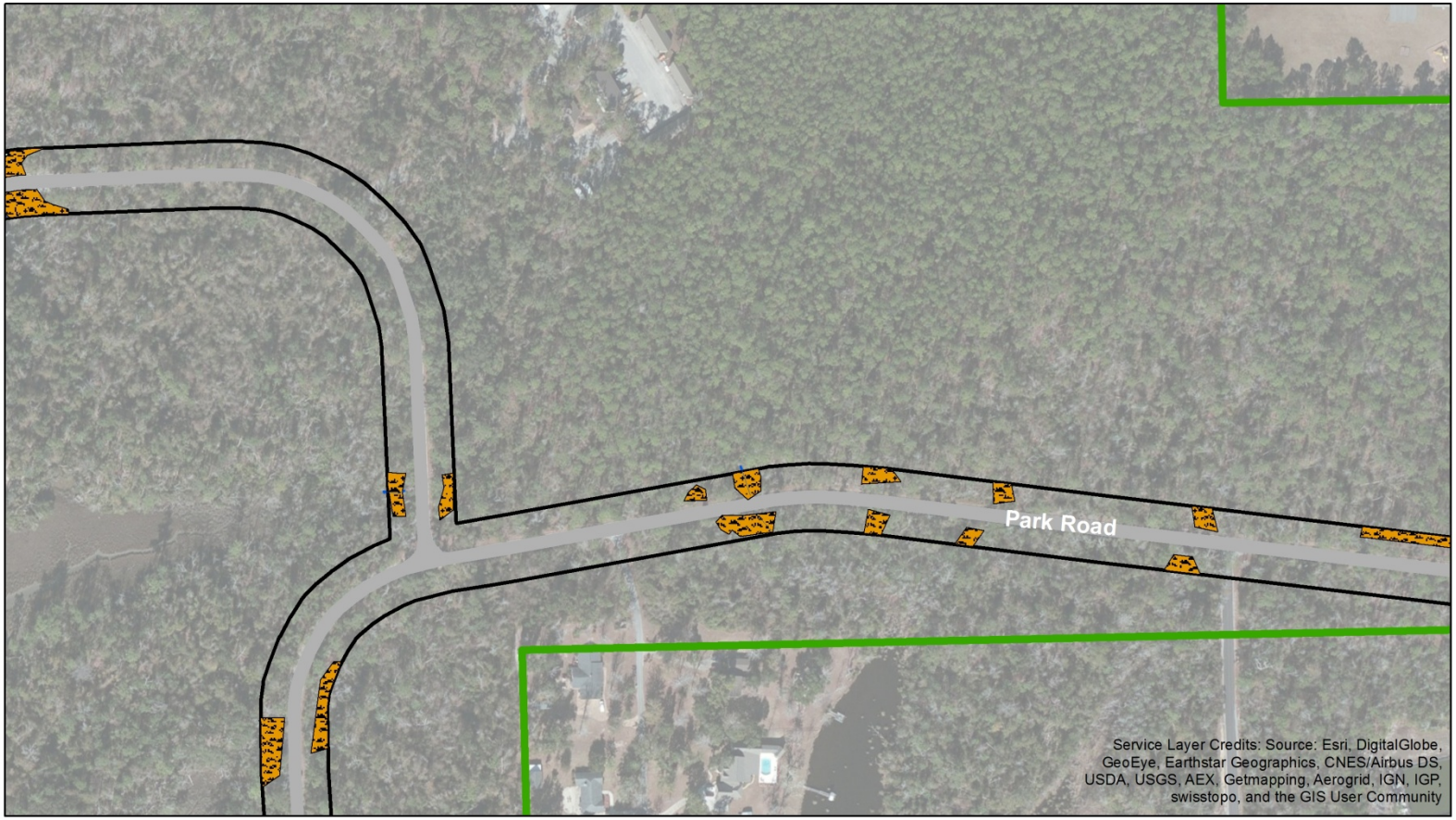


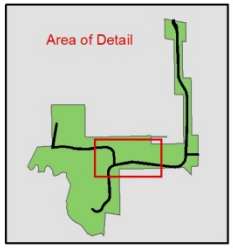
Figure 4: Wetlands by Cowardin Classification within the Study Corridor Gulf Islands National Seashore

U.S. Department of Interior/ National Park Service

Legend

- Estuarine Emergent
- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub
- Study Corridor
- Project Area Boundary





Legend

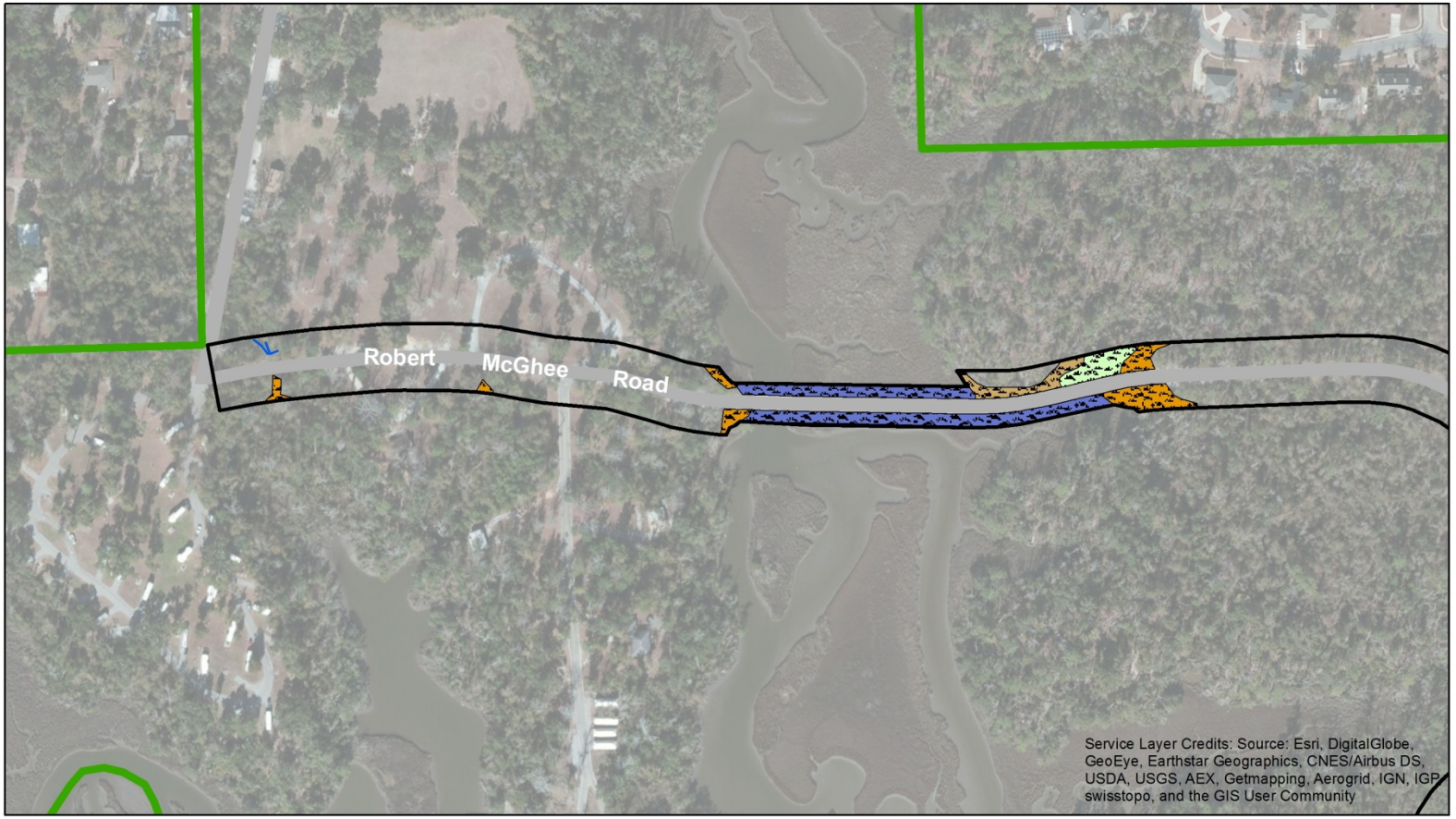
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- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub
- Study Corridor
- Project Area Boundary

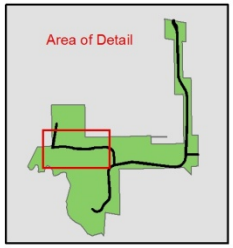
Figure 5: Wetlands by Cowardin Classification within the Study Corridor Gulf Islands National Seashore

U.S. Department of Interior/ National Park Service

North

0 125 250 500 Feet





Legend

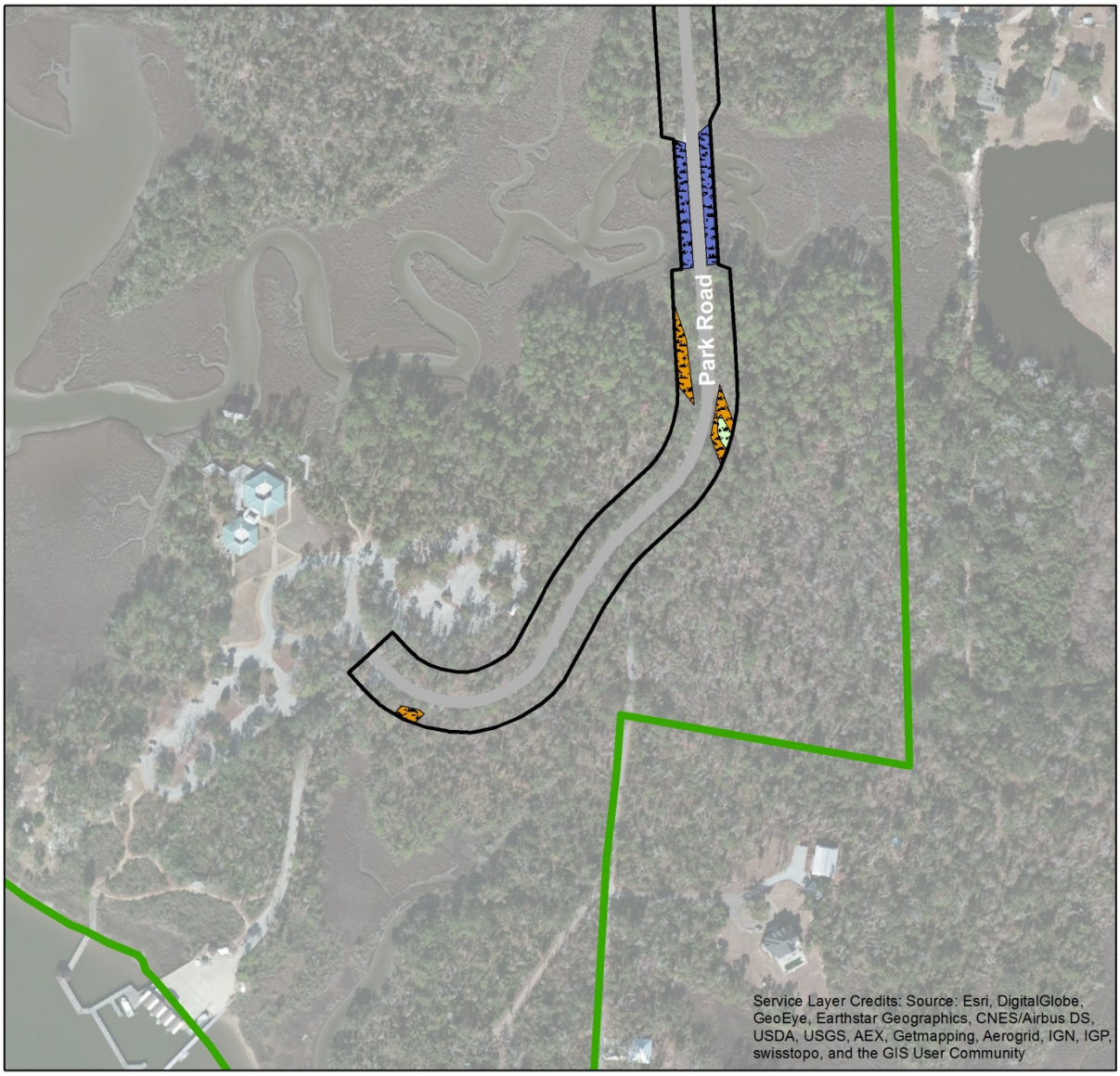
- Estuarine Emergent
- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub
- Study Corridor
- Project Area Boundary

Figure 6: Wetlands by Cowardin Classification within the Study Corridor Gulf Islands National Seashore

U.S. Department of Interior/ National Park Service

North

0 125 250 500 Feet



North

0 125 250 500 Feet

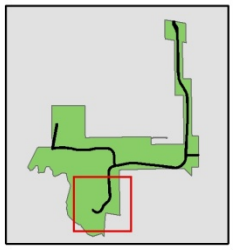


Figure 7: Wetlands by Cowardin Classificaiton within the Study Corridor Gulf Islands National Seashore

U.S. Department of Interior/ National Park Service

Legend

- Estuarine Emergent
- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub
- Study Corridor
- Project Area Boundary

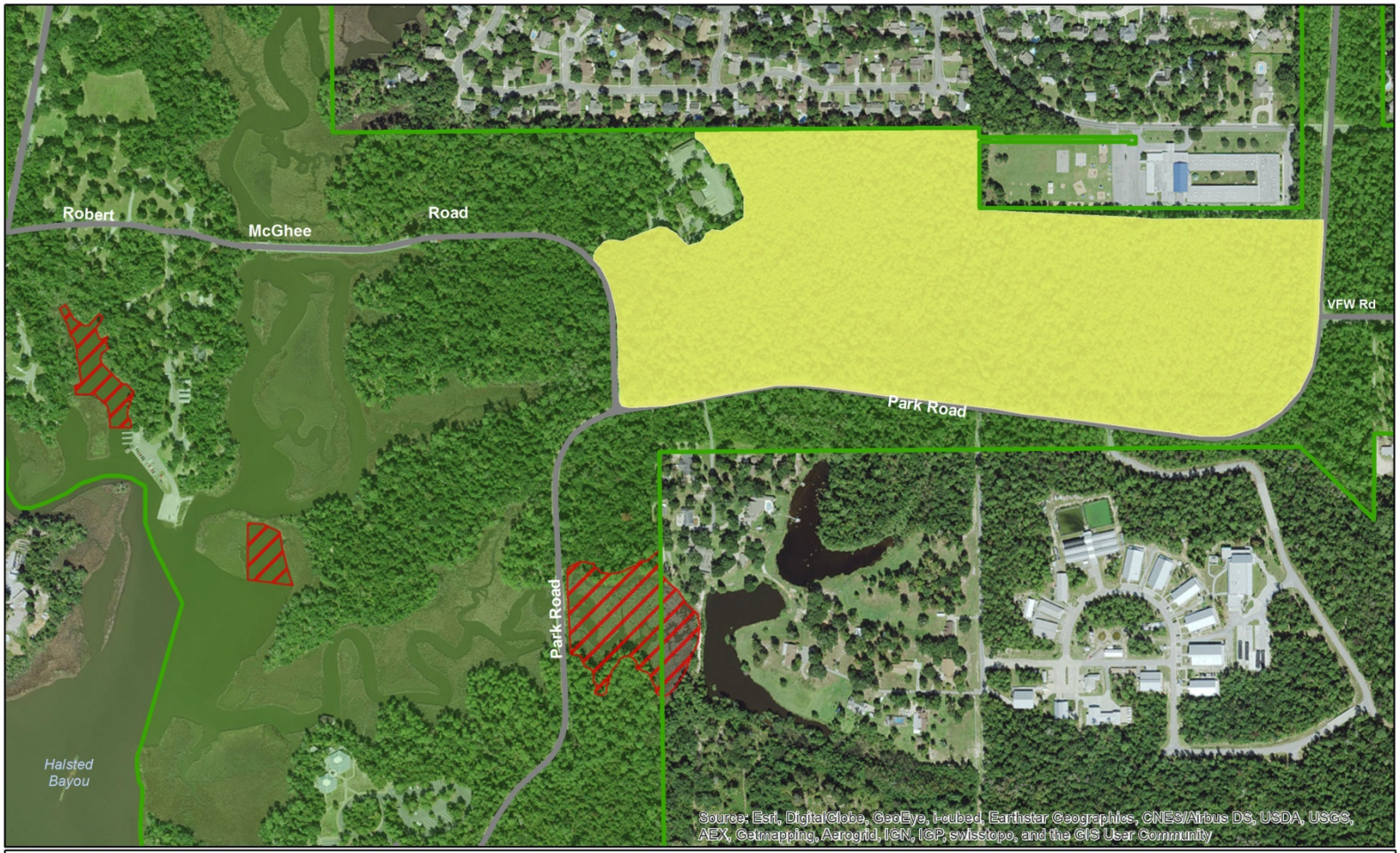


Figure 8: Proposed Mitigation Areas
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service

National Park Service
U.S. Department of the Interior

Gulf Island National Seashore
Davis Bayou Area Ocean Springs, Mississippi

STATEMENT OF FINDINGS
FOR
EXECUTIVE ORDER 11988 (FLOODPLAIN MANAGEMENT)

Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore: Project Description; PMIS 176842

Recommended:

Superintendent, Gulf Islands National Seashore

Certification of Technical Adequacy and Servicewide Consistency

Chief, Water Resources Division

Approved:

Director, Southeast Region

STATEMENT OF FINDINGS FOR EXECUTIVE ORDER 11988 (FLOODPLAIN MANAGEMENT)

Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore

INTRODUCTION

Situated in a dynamic coastal environment that includes rising sea levels, Gulf Island National Seashore is proposing a bicyclist and pedestrian use enhancements project which involves reducing the speed of automobiles and the number of interactions between pedestrians/bicyclists on Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore.

This Statement of Findings has been prepared in accordance with Executive Order 11988 (Floodplain Management), National Park Service (NPS) Director's Order #77-2, and Floodplain Management and Procedural Manual #77-2. The Statement of Findings summarizes the floodplain development associated with actions to enhance the use of Park and Robert McGhee Roads by bicyclists and pedestrians within the Davis Bayou Area of the Gulf Island National Seashore. Gulf Island National Seashore and the project area locations are shown on Figure 7-1 in Chapter 7. The Statement of Findings also describes the reasons why encroachment into the floodplain is required to implement the project, the site-specific flood risks involved, and the measures that would be taken to mitigate floodplain impacts.

Proposed Action and Preferred Alternative

The purpose of the project is to improve safety for pedestrians, bicyclists, and motorists along Park Road and Robert McGhee Road within the Davis Bayou Area of the park. This project involves improving road safety along Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore, managed by the National Park Service (Figure 7-3). Park Road and Robert McGhee Road are both two-lane roads with no shoulders. Park Road was constructed over 30 years ago to serve as the primary access to the William M. Colmer Visitor Center. In the past 20 years, approximately 10,000 additional residents have moved into Ocean Springs. As development has increased, neighboring residents have increasingly driven through the Davis Bayou Area as a shortcut to other destinations. Park Road offers an overpass over the railroad line that motorists use to avoid temporary blockages by passing trains. This road also provides a shorter route to many residences.

Robert McGhee Road (Route 016), previously known as Hanley Road, provides access to the Davis Bayou campground and public use boat dock. Robert McGhee Road also connects to a multiple-use bicycle-pedestrian trail route that extends to Halstead Road, located outside of the park. A portion of the Live Oak Bicycle Trail, a 15.5-mile route within the city of Ocean Springs, also traverses through the Davis Bayou Area along Robert McGhee Road.

Members of the public use these roads as walking, jogging, bicycling, and motor vehicle traffic routes. Motorists are known to drive excessive speeds that place non-motorized visitors at risk. The simultaneous use of the roads by all user groups results in a high probability for accidents, visitor conflicts, and potentially unsafe conditions for pedestrians, bicyclists, and motorists. Pedestrians and bicyclists using the road corridors within the Davis Bayou Area have limited space to maneuver to avoid approaching motorists, as there is little room beyond the edge of the road to traverse. Additionally, wetland areas adjacent to the roadway minimize the extent to which pedestrians and bicyclists can negotiate off-road to avoid collisions with motorists.

Motorized traffic also poses risks to park wildlife. High speeds of the motor vehicles increases the number of wildlife collisions on Park Road and Robert McGhee Road.

The exact project schedule for the Preferred Alternative is currently unknown. Construction is expected to begin in fall of 2016 and continue into spring 2017. Only the 2.17-mile Park Road portion of this project is being funded as this Phase IV early restoration project. The 0.82-mile portion on McGhee Road will be funded – and constructed – separately, but is included here and in the Environmental Assessment as a "connected action."

Under this alternative, project construction activities could include:

- excavating, grading, filling, and overlaying asphalt to widen the existing paved surface from 22-ft up to 36-ft paved surface with additional 4 ft non-paved shoulders, with appropriate striping;
- ground disturbance beyond the existing asphalt and up to 14 additional feet of asphalt proposed, 8 feet of non-paved shoulders, plus 5 feet from the toe of slopes for construction and heavy equipment maneuvering, thus widening the existing road corridors;
- placing and compacting fill adjacent to roadway including wetland areas;
- installing two traffic-calming medians (e.g., 10-ft wide ellipses) within the first mile of Park Road, similar to the entrance median;
- installing retaining walls along the road in areas where the road is elevated higher than the surrounding land forms;
- installing new or extending several existing culverts;
- removing woody vegetation and mature trees;
- planting native grasses on non-paved shoulders and grasses/trees on bare slopes or in new medians;
- constructing replacement boardwalks over portions of Stark Bayou on Robert McGhee Road, using cantilevers and pilings, with clearance for under-boardwalk wildlife crossings, or replacing the boardwalk with fill for the multiple use lane.
- replacing existing culvert bridge on Park Road over East Stark Bayou with a larger bottomless box culvert or small bridge, with restoration of water flow of wetlands on both sides of the road at culvert location, and possibly eliminating the existing cantilevered boardwalk on the west side of the road;
- conducting wetlands mitigation activities, possibly consisting of prescribed burns (NPS 2009);
- avoiding most existing utilities and possible relocating some existing utilities, where needed, (e.g., light poles, cable and phone lines, water hydrants, buried electrical lines and transformers);
- relocating/replacing road signs;
- relocating/replacing guardrails to meet current standards;
- installing park entrance sign at VFW Road;
- relocating park entrance sign at U.S. Route 90;
- Equipment likely to be used includes: track hoes, back hoes, graders, dump trucks, compactors, asphalt pavers, and road striping equipment;
- One lane will likely remain open during the project implementation except for occasional brief closures of both lanes as needed.

Brief Site Description

Gulf Island National Seashore encompasses barrier islands and coastal mainland in Mississippi and Florida and consists of 12 separate units stretching along 160 miles from Cat Island in Mississippi to the eastern end of Santa Rosa Island in Florida. The Davis Bayou Area of Gulf Islands National Seashore is located in Ocean Springs, Jackson County, Mississippi (see figure 7-1).

JUSTIFICATION FOR THE USE OF THE FLOODPLAIN

Road safety improvements are needed for the following reasons:

- Traffic on Park Road has increased by approximately 500 cars a day since the 2010 installation of a traffic light at the US Route 90 intersection;
- The road corridor does not have a shoulder and therefore, there is limited space for pedestrians and bicyclists to maneuver to avoid approaching motorists;
- Improving safety along the roads will reduce the number of interactions between automobiles and pedestrians/bicyclists and reduce the number of automobile/wildlife collisions in the Davis Bayou Area.

FLOOD RISK

A Statement of Findings is prepared if the action falls within the defined regulatory floodplain:

- Class I includes the location or construction of administrative, residential, warehouse and maintenance buildings, non-excepted parking lots or other man-made features, which by their nature entice or require individuals to occupy the site, are prone to flood damage, or result in impacts to natural floodplain values. Actions in this class are subject to the floodplain policies and procedures if they lie within the100-year regulatory floodplain (the Base Floodplain);
- Class II includes “critical actions”–those activities for which even a slight chance of flooding would be too great. Examples of critical actions include schools, hospitals, fuel storage facilities, irreplaceable records, museums, and storage of archeological artifacts. Actions in this class are subject to the floodplain policies and procedures if they lie within the 500-year regulatory floodplain;
- Class III includes all Class I or Class II actions that are located in High Hazard Areas, including coastal high hazard areas and areas subject to flash flooding. Actions in this class are subject to the floodplain policies and procedures if they lie within the Extreme Flood regulatory floodplain.

Portions of the project area are within the mapped 100-year and 500-year floodplains, as shown on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) numbers 28059C0292G, 28059C0293G, and 28059C0294G (FEMA 2009). The Federal Emergency Management Agency defines geographic areas as flood zones according to varying levels of flood risk. Each zone reflects the severity or type of flooding in the area, as depicted on Figure 7-5. The first zone, labeled “AE” on the Federal Emergency Management Agency maps, is within the 100-year floodplain and ranges in elevation from 16-18 ft National Geodetic Vertical Datum of 1988 (NAV88). This zone encompasses mostly the southern portion of the Davis

Bayou Area. The major source of flooding in this area would be flooding from overwash in the bayous. This zone would contain Class I floodplains.

The second zone on the Federal Emergency Management Agency mapping is zone "X (Other Flooded Areas)," designated for areas of 0.2% annual chance flood or areas of 1% annual chance flood with average depths of less than 1 ft or less of drainage areas less than 1 square mile. The major source of flooding in this area would be flooding would also be from the bayous from more severe overwash events. The third zone is also zone "X (Other Areas)," areas determined to be outside the 0.2% annual chance floodplain and less likely to flood than the 100-year floodplain or the Other Flooded Areas. Zone "X (Other Areas)" occurs in the northern portion of the study area just south of the Pasbt Road bridge crossing (Figure 7-5). The final zone, VE (Coastal Flood Zone), extends from offshore to the inland limit of a primary frontal dune along an open coast and any other area and is subject to high velocity wave action from storms. No project activities are proposed in zone VE.

Dynamic and challenging weather conditions are typical for the national seashore. Storms continuously reshape the landscape. The Gulf and Atlantic hurricane season begins on June 1 and continues through November 30 each year, and these dates encompass over 97% of tropical activity (NOAA 2012). The peak season runs from August through October, with 78% of the tropical storm days, 87% of the minor hurricane days, and 96% of the major storms. The number of tropical storms (sustained winds between 39 and 73 mph) occurring each season may vary from 4 to 12.

Flooding in the Davis Bayou Area of Gulf Islands National Seashore can range from minor events from high tides to major flooding from hurricanes and other coastal storms. Heavy precipitation can also flood low elevation areas. As demonstrated by Hurricane Katrina, the area is extremely vulnerable to coastal flood events. In Mississippi, the Katrina storm surge was 25 to 28 ft above normal tide and the surge damage reached several miles inland (NOAA 2012). The Davis Bayou Area of Gulf Islands National Seashore supports a number of natural features that reduce the severity of flooding. For example, coastal wetlands and bayous provide various functions, such as storage and sediment retention and dissipation of energy during flooding events. Wetlands and other depressions also function to store water during overwash or heavy precipitation (see section 7.2.6 on wetlands in this environmental assessment and the Wetland Statement of Findings located in the Appendix).

MITIGATION OF RISK TO PEOPLE AND STRUCTURES

Gulf Island National Seashore has a hurricane and flooding plan that would direct emergency actions and evacuations in the event of flooding. At the appropriate times visitors would be removed from the site and the site would be closed until potentially hazardous conditions subsided.

The road safety improvements would incorporate the use of materials to withstand the temporary flooding that comes from a storm surge whenever possible. In other locations, efforts will also be made to remove or tie down any loose materials that could be blown away by storm force winds. These activities would be easily implemented and most likely successful. Therefore, hazard to life and property from flooding would be reduced. NPS acknowledges the ecosystem services provided by wetlands and their benefits to floodplains and will work to minimize the impacts to them and will focus efforts to remove the least amount of wetland as possible. NPS will do this by keeping the footprint of the new paved area to a minimum while still meeting the objective of providing a safe and functional path for cyclists and pedestrians. NPS is also aware of

minimizing any possible impacts to floodplains and floodplain processes and will do so to the extent possible when designing the project.

The following mitigation measures would be applied when implementing the proposed action:

- Maintenance of generators, cranes, and any other stationary equipment operated within 150 feet of any natural or wetland area as necessary to prevent leaks and spills from entering the water;
- Development and implementation of spill prevention and control plans to minimize the risk of releasing petroleum and oil products to receiving waters;
- Employment of standard BMPs for construction to reduce erosion;
- Employment of temporary erosion controls prior to any land clearing or land disturbance on the project site, which would be monitored during construction to ensure proper function. Turbidity curtains, hay bales, and erosion mats would be used where appropriate.

SUMMARY

The National Park Service finds that the road safety improvements at Gulf Islands National Seashore are essential for public use and safety, despite the fact that the new locations would be located in flood-prone areas. The National Park Service also finds that in designing the improvements, there are no practicable alternatives for relocating portion of them outside of the floodplain since the existing roads are within the floodplain. However, it has been determined that consideration of a number of prospective mitigation actions would serve to reduce long-term impacts of the construction and operation of the facilities on floodplain resources and functions. This project is consistent with the policies and procedures of NPS Director's Order 77-2 (Floodplain Management) and Executive Order #11988.

Appendix F: Adopted Environmental Assessment

Expansion of Facilities Supporting Sea Turtle Science and Recovery, Construction of Patrol Cabins and Expansion of Incubation Laboratory, 2011

National Park Service
U.S. Department of the Interior
Padre Island National Seashore
Corpus Christi, Texas

Expansion of Facilities Supporting Sea Turtle Science and Recovery

Construction of Patrol Cabins and Expansion of Incubation Laboratory

Environmental Assessment

February 2011
Final



National Park Service
U.S. Department of the Interior
Padre Island National Seashore
Corpus Christi, Texas

Sea Turtle Patrol Cabin Construction

Environmental Assessment

Summary

Padre Island National Seashore proposes to construct two new sea turtle backcountry patrol cabins and to expand the Headquarters Sea Turtle Incubation Facility for supporting the Division of Sea Turtle Science and Recovery. Historically, a total of six bio-techs patrolled the backcountry (down-island), looking for nesting sea turtles. With the success of the program, the total number of down-island patrollers has doubled in size and the number of nests collected and incubated in the headquarters incubation facility has increased to a total of 127 in 2009. One backcountry patrol cabin is currently in place, providing overnight accommodations for six bio-techs and the current incubation facility can accommodate approximately 250 nests. The number of nests has been doubling about every three years and the staff in the incubation facility has grown to 35 people from 24 people in 2007. Because of the growth of the program, new or expanded facilities are necessary. The proposal to decommission the current cabin and replace it with two new cabins would also allow for better distribution of sea turtle patrollers along Padre Island National Seashore's Gulf of Mexico shoreline.

This environmental assessment evaluates two alternatives: a no-action alternative and an action alternative. The no-action alternative describes the current condition if no new cabins are constructed and the incubation facility is not expanded, while the action alternative addresses the decommissioning of the current cabin and construction of two new cabins and the expansion of the current incubation facility.

This environmental assessment has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet objectives of the proposal, 2) evaluates potential issues and impacts to Padre Island National Seashore's resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these impacts. Resource topics are included in this document because the resultant impacts may be greater-than-minor include: topography, geology, and soils; visitor use and experience; park operations; and floodplains. All other resource topics were dismissed because the project would result in negligible or minor effects to those resources. No major effects are anticipated as a result of this project. Public scoping was conducted to assist with the development of this document and comments were received, mostly in support of the proposed project.

Public Comment (After the comment period expired a FONSI was issued for this EA.)
If you wish to comment on the environmental assessment, you may post comments online at http://parkplanning.nps.gov/pais or mail comments to:

Superintendent
Padre Island National Seashore
P.O. Box 181300
Corpus Christi, TX 78480

This environmental assessment will be on public review for 30 days. 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 made publicly available at any time. Although 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.

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PURPOSE AND NEED

Introduction

Padre Island National Seashore was established by an act of Congress on September 28, 1962, and is managed by the National Park Service (NPS). The 130,434 acres of the Seashore were set aside as part of the National Park System in order –to save and preserve, for purposes of public recreation, benefit, and inspiration, a portion of the diminishing seashore of the United States that remains undeveloped.‖ (Public Law 87-712)

The significance of Padre Island National Seashore (National Seashore) lies in the unique, undeveloped nature of a natural, ever changing barrier island. The park is located along the southern coast of Texas, approximately eight miles south of Corpus Christi, and is bordered by the Laguna Madre and the Gulf of Mexico. The park occupies the central 68 miles of the approximately 113-mile long Padre Island (Figure 1). The Seashore's landscape changes from broad sandy beaches, to ridges of fore-island dunes, to grassy flats separated by smaller dunes, ephemeral ponds, and wetlands. Back-island dunes and wind tidal flats merge with the waters of the Laguna Madre and define the western portion of the Seashore. The park encompasses tens-of-thousands of acres of pristine wetlands that are important habitat for numerous flora and fauna species. The park is also the most significant nesting beach in the United States for the Kemp's ridley sea turtle and is a Globally Important Bird Area, which includes over 350 species of birds.



Figure 1. Park Vicinity Map.

This environmental assessment will examine the environmental impacts associated with the proposal to construct two new sea turtle patrol cabins and to expand the Headquarters sea turtle incubation facility at Padre Island National Seashore. The new patrol cabins would be constructed in the backcountry of the park and would replace the existing patrol cabin. The incubation facility expansion would expand the buildings to the north east of the current building into an area that was occupied by the Law Enforcement and Resource Management buildings that burned down in January of 2005.

This environmental assessment was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ) (40 CFR §1508.9), and the National Park Service Director's Order (DO)-12 (*Conservation Planning, Environmental Impact Analysis, and Decision-Making*).

Background

Kemp's ridley (*Lepidochelys kempii*) is the most critically endangered sea turtle species in the world, nesting primarily in Rancho Nuevo, Mexico. As part of the 1992 U.S. Fish and Wildlife Service (USFWS) recovery plan for the Kemp's ridley sea turtle, there has been a large effort to re-establish a nesting colony of endangered Kemp's ridley at the National Seashore. For three decades the NPS at Padre Island National Seashore has participated with this international recovery effort. When the project was initiated, Kemp's ridley had already been declared the world's most endangered sea turtle species and was feared that it would go extinct within 5-10 years unless immediate actions were undertaken to try to restore the species. Establishment of a secondary population would help mitigate a single event (e.g., hurricane) that could affect the species within a specific geographic area and safeguard against extinction.

From 1978-1988, 22,507 Kemp's ridley eggs were shipped from Rancho Nuevo to Padre Island National Seashore to re-establish a nesting colony there, where 55% of the Kemp's ridley nests documented in the U.S. have been found. Overall, 77.1% of the eggs hatched and the resulting hatchings were transferred to the National Marine Fisheries Service (NMFS) Laboratory in Galveston, Texas for head-starting (rearing in captivity). A total of 13,513 turtles imprinted to the National Seashore were released into U.S. waters, most after 9-11 months in captivity, and most into the Gulf of Mexico approximately 30 km offshore from the National Seashore and nearby locales. From 1989-2000, NMFS continued to head-start between 178 and 2,000 hatchlings per year, but these were obtained directly from Mexico and it was thought that they would return to Mexico to nest. Overall, nearly 10,500 of these Mexico imprinted head-starts were released, most in Gulf of Mexico waters off Galveston or the National Seashore (Shaver 2006).

To perpetuate nesting of Kemp's ridley and other sea turtles at Padre Island National Seashore, it is vital to locate and protect nests to ensure maximum hatching success and optimum sex ratios. Monitoring patrols, turtle and nest protection, and data collection have been on-going at the National Seashore. A record 195 Kemp's ridley nests were found in Texas during 2008, including 93 at Padre Island National Seashore (Shaver 2009). The National Seashore is now the most important nesting beach for Kemp's ridley turtles in the U.S., with 55% of the nests documented in the U.S. from 1989-2004 found at the park (Shaver 2006). Since Kemp's ridley nesting is increasing and more head-started turtles are maturing, more record years of nesting are expected in the future.

Because of the Endangered Species Act of 1973 and the approved 1992 U.S. Fish and Wildlife Service Kemp's Ridley Species Recovery Plan, as well as National Park Service's policy for proper management of special status species, the National Seashore has the responsibility of detecting and protecting nesting sea turtle females, their nests, and for ensuring safe passage of sea turtle hatchlings to the Gulf of Mexico. The USFWS assigned specific monitoring actions to the National Seashore as part of the Kemp's Ridley Sea Turtle Recovery Plan (USFWS and NMFS, 1992). Specifically, the Kemp's Ridley Sea Turtle Recovery Plan lists patrolling and managing Padre Island's nesting beach as task priorities, with the NPS as the responsible agency.

Currently, the National Seashore's nesting sea turtle monitoring and nest protection efforts (patrols) stage out of either the park's Headquarters or an existing cabin located within the backcountry of the National Seashore at the park's 39-mile mark (Fig. 2). This cabin provides overnight accommodations for sea turtle patrollers, and acts as a staging area for the beginning and ending of each day's patrols. The cabin acts as a shelter, where park employees may flee to during times of strong developing storms, and it also provides a refuge when a dangerous situation arises along the Gulf of Mexico beach. The cabin provides

a staging area for around-the-clock, 24-hour operations, which includes oversight of a sea turtle egg incubation facility.

With the success of the program, the current facilities at the National Seashore are no longer sufficient in size. The program has expanded because of the additional nesting of sea turtles, and in turn, has outgrown the park's current infrastructure that supports this program. The proposed action of building two sea turtle patrol cabins and expanding the incubation facilities is warranted not only to address the recovery task priority items in the Kemp's Ridley Recovery Plan, but is also necessary for park staff to proactively manage the park's number one natural resources management priority, as identified in the approved Padre Island National Seashore 1995 Resource Management Plan.

Purpose and Need

The purpose of the proposal is to provide a safe, functional and efficient working environment for Padre Island National Seashore staff in compliance with the goals and objectives of current plans and policy. The project is needed to accomplish the following objectives:

1. To replace the current backcountry patrol cabin, which is no longer suitable for the growing need of the National Seashore's sea turtle program, with two new cabins; thereby providing sufficient space for housing seasonal park staff.
2. To provide additional shelter or refuge for backcountry staff during times of inclement weather or a dangerous situation arising along the backcountry beach.
3. To provide better distribution of sea turtle incubation facilities along the Gulf of Mexico beach; thereby minimizing the distance and time for which the excavated eggs are transported to a secure incubation facility. This action would also allow for release of hatchlings closer to their nesting site along the Gulf beach.
4. Provide better distribution of cabins for more efficient daily and 24-hour operations of sea turtle monitoring efforts.
5. To expand the turtle incubation facility in the Headquarters compound to provide expanded hatching capacity in a climate controlled setting.

This project would maintain detection, incubation and protection efforts expanding activities in the park, thereby decreasing response time, increasing incubation capacity and increasing egg and turtle survival. Construction of the cabins would also be used to mitigate employee safety risks per the Operational Risk Review recommendations following a fatal accident in 2007.

The cabins would replace the original two cabins that were lost in 1999 to Hurricane Bret. After Hurricane Bret, limited funding allowed for construction of only one replacement cabin. To compensate, the replacement cabin's location was centered between the original locations. The centered location has proven less efficient to park staff for sea turtle nesting monitoring efforts. Construction of these two cabins would provide better distribution of park staff to begin and end their patrols each day, allowing for more work hours applied towards monitoring, while also reducing fuel consumption and the park's carbon footprint for total miles surveyed. During times of inclement weather and emergency situations, the extra cabins would allow for additional places within the park where park staff could find refuge or shelter (Fig. 2).

In addition to the current incubation facility found at the existing cabin at the park's 39-mile mark, this project would also include sea turtle egg incubation facilities, known as corrals, at each of the proposed cabins. Situating these corrals near the cabins provides overnight oversight and safety for the eggs. Having the corrals located at the National Seashore's 30, 39, and 50-mile marks would allow for optimum locations for park staff to deposit eggs to one of these incubation repositories shortly after being

excavated from their nest. This action would thereby reduce transport time of eggs in vehicles and the potential for egg embryo injury. Once sea turtles emerge from hatching, the hatchlings would be released at the 30, 39, or 50-mile mark incubation facility, thereby dispersing the hatchlings along the Gulf beach and providing releases closer to where the nests were found (Fig. 2).

As mentioned previously, because of the Endangered Species Act and the approved 1992 U.S. Fish and Wildlife Service Kemp's Ridley Species Recovery Plan, as well as National Park Service policy, the National Seashore has the responsibility of detecting and protecting nesting females and nests, and ensuring safe passage of hatchlings to the Gulf of Mexico. The USFWS assigned monitoring actions to the National Seashore as part of this recovery plan. Specifically, the Kemp's Ridley Sea Turtle Recovery Plan lists patrolling and managing Padre Island's nesting beach as task priorities, with the NPS as the responsible agency.

The proposed action of building two sea turtle patrol cabins and expanding the Headquarters incubation facility is warranted not only to address the recovery task priority items in the Kemp's Ridley Recovery Plan, but also necessary for park staff to proactively manage the park's number one natural resources management priority, as identified in the approved Padre Island National Seashore 1995 Resource Management Plan. As a result of the sea turtle backcountry monitoring patrol efforts and the Headquarters incubation efforts, backcountry staff have doubled in size and the number of nests recovered in the park has increased to 118 including one Green Sea turtle nest in 2009. Building two new cabins would provide adequate housing for the patrollers, and provide additional space for future growth and supporting operations. Each cabin would be able to accommodate up to twenty-three overnight campers. Expansion of the headquarters incubation facilities would provide sufficient space to handle the anticipated increase in sea turtle nests and staff to provide the appropriate care.

An appropriate categorical exclusion does not exist that covers construction activities and, therefore, an environmental assessment (EA) must be developed that analyzes the effects of a proposed action. This EA evaluates the environmental impacts of the No Action alternative and the National Seashore's proposal to construct two new Kemp's ridley sea turtle patrol cabins in the backcountry of Padre Island National Seashore as well as the expansion of the incubation facilities at the Headquarters compound.. The purpose of this analysis is to provide a decision-making framework for the NPS to approve the construction of two new sea turtle patrol cabins, and the expansion of the incubation facilities while protecting and preventing impairment to park resources and values.

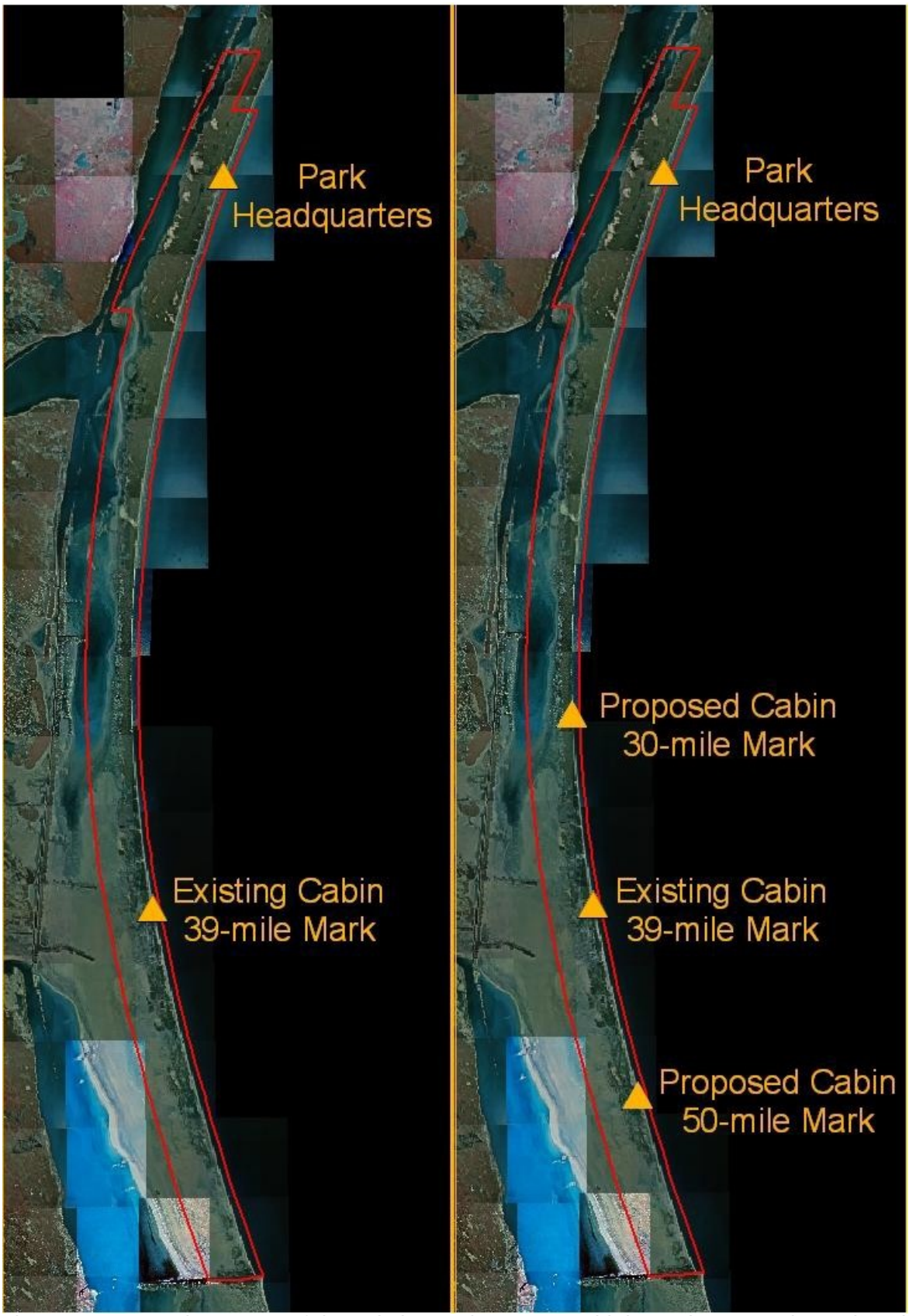


Figure 2- Comparison maps of the existing vs. the proposed (Alternative A vs. Alternative B)

Relationship to Other Plans and Policies

Current plans and policy that pertain to this proposal include the 1983 Padre Island National Seashore *General Management Plan* (NPS 1983), the 1995 Padre Island National Seashore *Resource Management Plan* (NPS 1995), and the 2006 *Management Policies* (NPS 2006). Following is more information on how this proposal meets the goals and objectives of these plans and policies:

- This project is consistent with the 1983 Padre Island National Seashore *General Management Plan*, which proposes the continued support and development of the successful Division of Sea Turtle Science and Recovery. The general management plan (GMP) identifies the actions, impacts, and mitigating measures necessary to resolve the issues facing the National Seashore. Many of these issues are the direct result of operating and occupying interim facilities that do not meet current health and safety codes. The construction of two new sea turtle patrol cabins and the expansion of the Headquarters incubation facilities is in accordance with the goals and objectives of the Seashore's existing GMP.
- Construction of two new sea turtle patrol cabins and the expansion of the Headquarters incubation facilities would provide operational facilities for the Division of Sea Turtle Science and Recovery that complies with the 1996 Padre Island National Seashore *Resource Management Plan*. The resources management plan (RMP) is an implementation plan that provides a systemized course of action that can serve as a bridge between the broad directions provided in the GMP. The Seashore's RMP was completed and approved in 1996 and identified the protection and monitoring of sea turtles as a high park priority (NPS 1996), as sea turtles are the only federal and state-listed endangered species nesting in the park.
- The proposal is consistent with the goals and objectives of the *2006 National Park Service Management Policies* (NPS 2006) that state that major park facilities within park boundaries should be located so as to minimize impacts to park resources. The proposed site of the new administration building was identified to minimize harm to all park resources, particularly significant paleontological resources.

Appropriate Use

Section 1.5 of *Management Policies* (2006), ―Appropriate Use of the Parks,‖ directs that the National Park Service must ensure that park uses that are allowed would not cause impairment of, or unacceptable impacts on, park resources and values. A new form of park use may be allowed within a park only after a determination has been made in the professional judgment of the park manager that it would not result in unacceptable impacts.

Section 8.1.2 of *Management Policies* (2006), Process for Determining Appropriate Uses, provides evaluation factors for determining appropriate uses. All proposals for park uses are evaluated for‖:

- consistency with applicable laws, executive orders, regulations, and policies;
- consistency with existing plans for public use and resource management;
- actual and potential effects on park resources and values;
- total costs to the Service; and
- Whether the public interest will be served.

Park managers must continually monitor all park uses to prevent unanticipated and unacceptable impacts. If unanticipated and unacceptable impacts emerge, the park manager must engage in a thoughtful, deliberate process to further manage or constrain the use, or discontinue it.

From Section 8.2 of *Management Policies*: ―To provide for enjoyment of the parks, the National Park

Service will encourage visitor use activities that

- are appropriate to the purpose for which the park was established, and
- are inspirational, educational, or healthful, and otherwise appropriate to the park environment; and
- will foster an understanding of and appreciation for park resources and values, or will promote enjoyment through a direct association with, interaction with, or relation to park resources; and
- can be sustained without causing unacceptable impacts to park resources and values.‖

Support buildings are common and vital structures in most park units. Proper consideration for location, sizing, as well as construction materials and methods ensures that unacceptable impacts to park resources and values do not occur. The proposed cabins and the expansion of the Headquarters incubation facilities are consistent with the park's general management plan and other related park plans. With this in mind, the NPS finds that construction and use of the sea turtle patrol cabins and the expansion of the Headquarters incubation facilities are an acceptable use at Padre Island National Seashore.

The next question is whether such use, and the associated necessary and appropriate impacts, can be sustained without causing unacceptable impacts to park resources and values. That analysis is found in the *Environmental Consequences* chapter.

Scoping

Scoping is a process to identify the resources that may be affected by a project proposal, and to explore possible alternative ways of achieving the proposal while minimizing adverse impacts. Padre Island National Seashore conducted internal scoping with appropriate National Park Service staff, as described in more detail in the *Consultation and Coordination* chapter. The National Seashore also conducted external scoping with the public and interested/affected groups.

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposal to construct the new cabins, and to generate input on the preparation of this environmental assessment. The scoping letter dated February 12, 2010 was mailed to over 500 residents of Corpus Christi, TX, greater Texas Coastal Bend area, including landowners adjacent to the National Seashore. In addition, the scoping letter was mailed to various federal and state agencies, local governments, local news organizations, and the affiliated Native American tribe. Scoping information was also posted on the National Seashore's website.

During the 30-day scoping period, 17 public responses were received from The NPS online site Planning, Environment and Public Comment (PEPC) and three letters were received by the superintendent, including one from TPWD and one from the USACE. Nearly all of the respondents were in favor of constructing the two new cabins, for reasons as identified by the scoping brochure: egg protection, temporary staff housing, and safety. One letter suggested an Environmental Impact Statement was necessary for the Kemp's ridley recovery plan, and the alternative of moving the program to Matagorda Island—a non-NPS managed land. As this document is for the proposed construction of two cabins and an addition for the turtle incubation facility at headquarters, this comment is out of scope. In addition, Padre Island National Seashore is maintaining compliance with the National Marine and Fisheries Service (NMFS) and the U. S. Fish and Wildlife Service's (USFWS) Kemp's ridley recovery plan by this proposed action. Any request for NEPA analysis for the NMFS and USFWS plans should be addressed to their offices. The 17 public responses provided no new substantive alternatives. If an alternative had been proposed which met the objectives the interdisciplinary team would have examined the alternative, weighed its merits and either carried it forward for additional analysis or dismissed it. In addition, the Native American tribe, Tonkawa, did not respond to our request for input for the proposed project. More information regarding external scoping and Native American consultation can be found in *Comments and Coordination*.

Impact Topics Retained For Further Analysis

In this section and the following section on *Impact Topics Dismissed from Further Analysis*, the National Park Service takes a "hard look" at potential impacts by considering the direct, indirect, and cumulative effects of the proposed action on the environment, along with connected and cumulative actions. Impacts are described in terms of context and duration. The context or extent of the impact is described as localized or widespread. The duration of impacts is described as short-term, ranging from days to three years in duration, or long-term, extending up to 20 years or longer. The intensity and type of impact is described as negligible, minor, moderate, or major, and as beneficial or adverse. The NPS equates "major" effects as "significant" effects. The identification of "major" effects would trigger the need for an Environmental Impact Statement (EIS). Where the intensity of an impact could be described quantitatively, the numerical data is presented; however, most impact analyses are qualitative and use best professional judgment in making the assessment.

The NPS defines "measurable" impacts as moderate or greater effects. It equates "no measurable effects" as minor or less effects. "No measurable effect" is used by the NPS in determining if a categorical exclusion applies or if impact topics may be dismissed from further evaluation in an EA or EIS. The use of "no measurable effects" in this EA pertains to whether the NPS dismisses an impact topic from further detailed evaluation in the EA. The reason the NPS uses "no measurable effects" to determine whether impact topics are dismissed from further evaluation is to concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail in accordance with Commission on Environmental Quality (CEQ) regulations at 1500.1(b).

In this section of the EA, the NPS provides a limited evaluation and explanation as to why some impact topics are not evaluated in more detail. Impact topics are dismissed from further evaluation in this EA if:

- they do not exist in the analysis area, or
- they would not be affected by the proposal, or the likelihood of impacts are not reasonably expected, or
- through the application of mitigation measures, there would be minor or less effects (i.e., no measurable effects) from the proposal, and there is little controversy on the subject or reasons to otherwise include the topic.

Due to there being no effect or no measurable effects, there would either be no contribution towards cumulative effects or the contribution would be low. For each issue or topic presented below, if the resource is found in the analysis area or the issue is applicable to the proposal, then a limited analysis of direct and indirect, and cumulative effects is presented. There is no impairment analysis included in the limited evaluations for the dismissed topics because the NPS's threshold for considering whether there could be impairment is based on "major" effects.

Impact topics for this project have been identified on the basis of federal laws, regulations, and orders; 2006 *Management Policies*; and National Park Service knowledge of resources at Padre Island National Seashore. Impact topics that are carried forward for further analysis in this environmental assessment are listed below along with the reasons why the impact topic is further analyzed. For each of these topics, the following text also describes the existing setting or baseline conditions (i.e., affected environment) within the project area. This information will be used to analyze impacts against the current conditions of the project area in the *Environmental Consequences* chapter.

Topography, Geology, and Soils

According to the National Park Service's 2006 *Management Policies*, the National Park Service will preserve and protect geologic resources and features from adverse effects of human activity, while allowing natural processes to continue (NPS 2006). These policies also state that the National Park

Service will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources.

The Headquarters Incubation facility expansion would take place within the Headquarters compound, in an area that has previously been used for park buildings. The area is currently covered with leveled caliche fill and has no significant topographic or geologic features.

The proposed construction of the two new sea turtle patrol cabins would be on the Gulf of Mexico beachfront, set within its dune-line. The dunes of the National Seashore are significant topographic/geologic features. Minor modifications of the topography would be required to provide a level surface on which to construct the cabins, which would have a negligible to minor effect to the topography of this area. The construction for the cabins would also require excavation, which would displace and disturb soils, primarily in the footprint of the new cabins. Soils may also be disturbed and compacted on a temporary basis in the locations were the park would stage construction materials.

Given that there are significant topographic or geologic features in the project areas, and that the proposed actions would result in negligible to minor, and temporary and permanent adverse effects to topography, geology, and soils, the topics of topography, geology, and soils have been carried forward for further analysis in this document.

Special Status Species

The Endangered Species Act of 1973 requires examination of impacts on all Federally-listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. In addition, the 2006 *Management Policies* and Director's Order-77 *Natural Resources Management Guidelines* require the National Park Service to examine the impacts on Federal candidate species, as well as State-listed threatened, endangered, candidate, rare, declining, and sensitive species (NPS 2006). For the purposes of this analysis, the U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department were contacted with regards to Federally- and State-listed species to determine those species that could potentially occur on or near the project area.

Known threatened, endangered, or other species of concern occurring in the project areas include: piping plover (*Charadrius melodus*), northern aplomado falcon (*Falco femoralis septentrionalis*), reddish egret (*Egretta rufescens*), eastern brown pelican (*Pelecanus occidentalis*), sooty tern (*Sterna fuscata*), American peregrine falcon (*Falco peregrines anatum*), spot-tailed earless lizard (*Holbrookia lacerate*), Texas horned lizard (*Phrynosoma cornutum*), as well as green sea turtle (*Chelonia mydas*), loggerhead sea turtle (*Caretta caretta*), Atlantic hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle(*Dermochelys coiacea*), and Kemp's ridley sea turtle (*Lepidochelys kempii*).

Given that there are special status species within the project areas, and that the proposed actions would occur during the sea turtle nesting season, potentially resulting in adverse effects, the topic of special status species has been carried forward for further analysis in this document.

Visitor Use and Experience

According to 2006 *Management Policies*, the enjoyment of park resources and values by people is part of the fundamental purpose of all park units (NPS 2006). The National Park Service is committed to providing appropriate, high quality opportunities for visitors to enjoy the parks, and will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of society. Further, the National Park Service will provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks. The National Park

Service 2006 *Management Policies* also state that scenic views and visual resources are considered highly valued associated characteristics that the National Park Service should strive to protect (NPS 2006).

The primary visitor activity is recreating on the beach, which may include beachcombing, fishing, bird watching, relaxing, and windsurfing; however, due to the extreme difficulty of access, only a few of the National Seashore's 600,000+ annual visitors travel into the park's backcountry beach, found along the Gulf of Mexico at the south end of the park.

The proposed patrol cabins would be located respectively at the 30-mile mark and 50-mile mark locations; areas that are frequented by our down-island, backcountry beach visitors. While the turtle patrol cabins will be set back into the dune line and only visible to visitors while passing directly in front the buildings. Because the proposed project would visually reconfigure the area in the two proposed places on the beach, the topic of visitor use and experience has been carried forward for further analysis.

Park Operations

Current park operations for the Division of Sea Turtle Science and Recovery include six backcountry patrollers who monitor for nesting sea turtles. The current cabin in place provides the bio-techs with overnight accommodations, and also acts as a staging area for their efforts to assist with sea turtle standings and efforts for the re-establishment of a second nesting population of the Kemp's ridley sea turtle.

Location of the current cabin was placed between the locations where the original two sea turtle patrol cabins were located, prior to being destroyed by Hurricane Brett in 1999. The two cabins that were destroyed by Hurricane Brett were ideally placed for maximum efficiency of the sea turtle patrol efforts; however, when funding for replacement of the cabins wasn't enough to build two cabins, only one cabin was constructed in a location situated between the locations for the original cabins.

The proposed project of replacing the two cabins would restore the efficiency of patrols. The backcountry patrols begin and end each day from the sea turtle patrol cabins; therefore, having two patrol cabins would allow the patrols to begin and end closer to the patrollers survey areas, i.e., the patrol cabins would be positioned closer to the patrollers' survey areas; therefore, less amount of travel time to and from the survey areas is necessary.

Another important reason for this action is the park's need to establish more areas for nest protection. To prevent loss of sea turtle nests to predators, high tides and passing vehicle traffic, the National Seashore has been excavating sea turtle nests. The collected eggs are then incubated under the care of the NPS. While all of the collected eggs were once incubated within a controlled lab, the park has chosen to expand the outdoor incubation areas and the Headquarters incubation facilities to accommodate the success of Kemp's ridley sea turtle recovery effort, with the proposed egg corrals at the turtle cabins helping to minimize the time spent in transport from the southern part of the beach to the Headquarters incubation facility area. These outside facilities are referred to as corrals, and basically consist of a designated area on the Gulf beach, protected from predators and human disturbance by the use of chain-link fence. These corrals will be sited as high on the beach as possible to avoid being inundated by normal high tides.

The proposed project would accommodate the regional office's approved increase in staffing for the Division of Sea Turtle Science and Recovery. Historically, there has been only six bio-techs patrolling the backcountry beaches for nesting sea turtles, but with the success of the program, the National Seashore has hired additional bio-techs to patrol down-island for sea turtles as well as staff for the Headquarters incubation facilities to handle the increasing work load that comes with continued success of the recovery program.

Construction of the new sea turtle patrol cabins in the project areas and expansion of the Headquarters incubation facility would have a measurable effect on the National Seashore's staff and how/where they

conduct their work. For these reasons, the topic of park operations has been carried forward for further analysis in this document.

Floodplains

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The National Park Service under 2006 *Management Policies* and Director's Order 77-2 *Floodplain Management* will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director's Order 77-2 *Floodplain Management*, certain construction within a 100-year floodplain requires preparation of a statement of findings for floodplains.

The Park is entirely within the 100-year floodplain as defined by US Army Corp of Engineers and the Federal Emergency Management Agency; therefore, a statement of findings for floodplains will be prepared. The proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006.

Impact Topics Dismissed From Further Analysis

Historic Structures

The National Park Service, as steward of many of America's most important cultural resources, is charged to preserve historic properties for the enjoyment of present and future generations. According to the National Park Service's 2006 *Management Policies and Cultural Resource Management* (Director's Order-28), management decisions and activities throughout the National Park System must reflect awareness of the irreplaceable nature of these resources (NPS 2006). The National Park Service will protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with these policies and guidelines.

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation an opportunity to comment in the consultation process. The term ―historic properties‖ is defined as any site, district, building, structure, or object eligible or listed in the National Register of Historic Places, which is the nation's inventory of historic places and the national repository of documentation on property types and their significance. More information about this consultation can be found in the *Consultation and Coordination* chapter.

The term ―historic structures‖ refers to both historic and prehistoric structures, which are defined as constructions that shelter any form of human habitation or activity. The proposed locations for the two new sea turtle patrol cabins were surveyed for cultural resources on April 8, 2010, and no structures were identified in the immediate project area. Further, the National Seashore consulted with the park's state historical preservation office, Texas Historical Commission, for concurrence with the park's negative findings for the NPS survey (THC 2010).

The project areas for the two sea turtle patrol cabins and the sea turtle lab expansion contained no historic structures; therefore, the topic of historic structures has been retained for further analysis.

Paleontological Resources

According to 2006 *Management Policies*, paleontological resources (fossils), including both organic and mineralized remains in body or trace form, will be protected, preserved, and managed for public education, interpretation, and scientific research (NPS 2006). The proposed sites for the construction of two new sea turtle patrol cabins are within the fore dunes on the surface of the Gulf of Mexico beach.

The proposed locations for the two new sea turtle patrol cabins was surveyed by an NPS geologist on April 8, 2010 and no paleontological items were identified in the immediate project area. While the proposed project areas are not expected to contain any paleontological deposits, appropriate steps would

be taken to protect any paleontological resources that are inadvertently discovered during construction. Because the project would not disturb any known paleontological sites, the affect of the project on paleontological resources is expected to be negligible. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Vegetation

According to the National Park Service's 2006 *Management Policies*, the National Park Service strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants (NPS 2006). The project areas are located on the Gulf of Mexico shoreline within the Gulf dunes. These areas are made up of two rows of fore dunes adjacent to the Gulf beach and high dune fields with scattered upland swales. The two rows of fore dunes are typically dominated by silver-leaf croton (*Croton punctatus*), beach morning-glory (*Ipomoea pescaprae*), camphorweed (*Heterotheca subaxillaris*), prairie clover (*Dalea sp.*), western ragweed (*Ambrosia psilostachya*), and sea oats (*Uniola paniculata*). The high dune fields are generally dominated by camphorweed, Prairie clover, sea oats, seacoast bluestem (*Schizachyrium scoparium*), western ragweed (*Ambrosia psilostachya*), and some tropic croton (*Croton glandulosus* var. *lindheimeri*).

In the areas of construction where the proposed footprints of the new cabins are, vegetation would be displaced, disturbed, and/or compacted. Any disturbance, where appropriate, would involve recontouring and restoring of dunes, which includes replanting of disturbed vegetation. Because the proposed construction would consist of being elevated on stilts, it is thought disturbance to vegetation would be minor or negligible. An addition, a monitor would be onsite to identify any rare, protected species, i.e., Roughseed sea-purslane (*Sesuvium trianthemoides*). In the area that the incubation facilities would be expanded the area has been built up and leveled with caliche. The area is maintained as a lawn, watered and cut regularly. Sand Burr and native grasses dominant the plant community. After construction is finished disturbed areas will be leveled and seeded with native grasses. This proposed action is thought to have minor or negligible impacts and would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Wildlife

According to the National Park Service's *2006 Management Policies*, the National Park Service strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of animals (NPS 2006). Mammals commonly found in the National Seashore include white-tailed deer, coyote, bobcat, badger, black-tailed jackrabbit, pocket gopher, raccoon, ground squirrel, kangaroo rat, mice, and bats. There are 385 documented species of birds, which includes sandhill crane, snowy plover, American bittern, long-billed curlew, eastern meadowlark, black skimmer, caracara, northern bobwhite, and American white pelican, and loggerhead shrike. Reptiles and amphibian species found at the National Seashore include the keeled earless lizard, whiptail lizard, western diamondback rattlesnake, slender glass lizard, ornate box turtle, northern leopard frog, green tree frog, Hurter's spadefoot toad, and five of the eight sea turtles found in the world. There are also numerous insect species, fish, crustaceans and mollusks.

Protection under the Migratory Bird Treaty Act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition, this act serves to protect environmental conditions for migratory birds from pollution or other ecosystem degradations. Padre Island National Seashore has 385 birds documented for being within the park. Many of these birds are found at the proposed locations for this project; however, there are no known nesting sites or vital foraging and roosting grounds for the proposed

locations. Construction-related noise and vehicles accessing the sites could potentially disturb migratory bird species, but these adverse impacts would be 1) temporary, lasting only as long as construction, and 2) negligible, because suitable habitat for migratory birds is found throughout the region.

The locations for the proposed sea turtle patrol cabins are in beach areas that are frequently impacted by storm ocean waters, where little fresh water and minimal vegetation is present in the project areas. The project areas are accessible by beach driving; therefore, presence of humans and human-related activities are frequent occurrences.

If this proposed project is carried forward, smaller wildlife such as rodents, reptiles, and amphibians and their habitat would be displaced or eliminated during construction of the new cabins and egg incubation facility expansion. Disturbed areas would be revegetated and restored following construction, which would result in a negligible to minor adverse impact to the wildlife and wildlife habitat in the immediate area of construction.

During construction noise would also increase, which may disturb wildlife in the general area. Construction-related noise would be temporary, and existing sound conditions would resume following construction activities. Therefore, the temporary noise from construction would have a negligible to minor adverse effect on wildlife. The Headquarters compound has nearly constant foot and vehicle traffic and noise from construction would have little effect on wildlife. Further, such minor or negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

In addition, the expansion of the Headquarters incubation facility will have little to no effect on wildlife because construction will be within a highly modified area that is heavily used by park staff and provides no suitable habitat for listed species.

Water Resources

National Park Service policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating federal actions that result in potential degradation of waters of the United States and issuing permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the United States.

The proposed turtle patrol cabin project areas are located along the Gulf of Mexico shoreline; therefore, navigable waters are present. Water quality, water quantity, and drinking water are not expected to be affected by the project. The size of the two new patrol cabins' footprints (approximately 2,500 square feet each) would increase the amount of impervious surface in the area, which could possibly increase the erosion potential of the areas; however, the building will be elevated on piers and run off from the roofs will be able to infiltrate under the buildings and as these areas occur within the intertidal zone, these effects are thought to be minimal. The caliche fill that the incubation facility expansion will be constructed on is nearly impermeable and does not act as an infiltration zone to the water table. Sheet wash patterns to the surrounding natural infiltration areas would not be significantly altered by the expansion of the incubation facility. To further assist with erosion and water quality, disturbed areas would be revegetated and recontoured following construction. The proposed action would result in negligible effects to water resources. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Wetlands

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Executive Order 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, §404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge or dredged or fill material or excavation within waters of the United States. National Park Service policies for wetlands as stated in 2006 *Management Policies* and Director's Order 77-1 *Wetlands Protection* strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1 *Wetlands Protection*, proposed actions that have the potential to adversely impact wetlands must be addressed in a statement of findings for wetlands.

While the Gulf of Mexico beach is considered wetland and the proposed project is located within these areas, the construction of these cabins would be elevated; therefore, the amount of impacts to wetlands would be minor in degree. The site of the incubation facility expansion has been elevated above the adjacent undisturbed area with caliche fill and does not qualify as wetlands and does not support wetland vegetative species. Water drains in the form of sheet wash and standing water is only present during significant flood events. Because these effects would not result in any unacceptable impacts to wetlands, this topic is dismissed from further analysis in this document and a wetland statement of findings will not be prepared.

Archeological Resources

In addition to the National Historic Preservation Act and the National Park Service 2006 *Management Policies*, the National Park Service's Director's Order-28B *Archeology* affirms a long-term commitment to the appropriate investigation, documentation, preservation, interpretation, and protection of archeological resources inside units of the National Park System. As one of the principal stewards of America's heritage, the National Park Service is charged with the preservation of the commemorative, educational, scientific, and traditional cultural values of archeological resources for the benefit and enjoyment of present and future generations. Archeological resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the National Park System reflect a commitment to the conservation of archeological resources as elements of our national heritage.

The proposed locations for the two new sea turtle patrol cabins were surveyed by a NPS archeologist on April 8, 2010, and no archeological sites were identified in the immediate project area, further, the National Seashore consulted with the park's state historical preservation office (SHPO), Texas Historical Commission, for concurrence with the park's negative findings for the NPS archeological survey. (THC 2010). On August 24-25, 2010, the proposed site of the incubation facility expansion was surveyed by a NPS archeologist and no archeological sites were identified in the immediate project area. A letter to the SHPO has been prepared for the incubation lab expansion archeological survey, and the results of the concurrence letter will be included with either the Finding of No Significant Impact (FONSI) or the Notice of Intent (NOI) for Environmental Impact Statement (EIS). While the proposed project areas are not expected to contain archeological deposits, appropriate steps would be taken to protect any archeological resources that are inadvertently discovered during construction. Because the project would not disturb any known archeological sites, the affect of the project on archeological resources is expected to be negligible. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Ethnographic Resources

National Park Service's Director's Order-28 *Cultural Resource Management* defines ethnographic resources as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. According to DO-28 and Executive Order 13007 on sacred sites, the National Park Service should try to preserve and protect ethnographic resources.

In consultation with Native American tribes, ethnographic resources are not known to exist in the proposed project areas. Native American tribes traditionally associated with Padre Island National Seashore were apprised of the proposed project in a letter dated March 18, 2010, and no responses were received from these tribes. Tribal responses to previous park projects confirm their cultural affiliations with the area. The previous contacts with tribal representatives provide no reason to expect impacts to significant ethnographic resources. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Cultural Landscapes

According to the National Park Service's Director's Order-28 *Cultural Resource Management Guideline*, a cultural landscape is a reflection of human adaptation and use of natural resources, and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. Although a cultural landscape inventory has not been conducted for the National Seashore, the features within the general turtle patrol cabin project areas are temporary in nature and not likely to contribute to a significant cultural landscape. The sea turtle patrol cabins and the Headquarters incubation facility expansion will be constructed with design and materials that will blend in well with the current architectural style of structures within the Headquarters compound. Further, since these structures are not likely to contribute to a significant cultural landscape, no unacceptable impacts would occur; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because no contributing structures are likely present within the project areas, there would be no unacceptable impacts to cultural landscapes; this topic is dismissed from further analysis in this document

Museum Collections

According to Director's Order-24 *Museum Collections,* the National Park Service requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, National Park Service museum collections.. As the National Seashore is located within a 100-year floodplain, no museum specimens are kept inside of the park; therefore, the National Seashore's museum collection would not result in any unacceptable impacts. The proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any impacts, this topic is dismissed from further analysis in this document.

Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The act establishes specific programs that provide special protection for air resources and air quality related values associated with National Park Service units. Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. Padre Island National Seashore is designated as a Class II air quality area under the Clean Air Act. A Class II designation by the State of Texas, as authorized by the Prevention of Significant Deterioration provisions of the Clean Air Act (EA Engineering, Science and Technology

2003), indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter as specified in §163 of the Clean Air Act. Further, the Clean Air Act provides that the federal land manager has an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts (EPA 2000). The park's air quality is protected by allowing limited increases over baseline concentrations of sulfur dioxide, nitrogen oxides, and particulate matter.

Mobile source emissions include highway and non-road vehicles, which affect air quality through the production of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic compounds. Vehicle emissions occur from both NPS operated and visitor vehicles. The National Seashore operates 35 road vehicles annually, but the number of visitor vehicles is estimated. The number of visitor vehicles is correlated to the number of annual visitors to the park. In 2009, the National Seashore visitation was recorded at 642,163 recreational visitors, with an average visitor per vehicle ratio of 2.8 (EA Engineering, Science and Technology 2003), which equates to 229,344 visitor vehicles. Based on vehicle calculations mentioned above the emissions generated by road vehicles at Padre Island National Seashore are provided in Table 2. Particulate emissions include exhaust and road dust.

Table 1. Mobile source emissions at Padre Island National Seashore from road vehicles.

Activity	Particulates (lbs/yr)	Sulfur Dioxide (lbs/yr)	Nitrogen Oxides (lbs/yr)	Carbon Monoxide (lbs/yr)	Volatile Organics (lbs/yr)
Visitor Vehicles	6,880	--	9,174	114,672	6,880
NPS Vehicles	213	--	391	3,937	213
Totals	7,093	--	9,565	118,609	7,093
Per Vehicle Total	.03	--	.04	.5	.03

Constructing the new patrol cabins would require vehicles to deliver construction materials, and transport construction personnel to the proposed construction sites. These activities could result in temporary increases in air quality emissions whenever construction vehicles are operated. However, vehicle emissions would dissipate quickly due to prevailing southeast winds from March through September and north-northeasterly winds from October through February (PAIS 2000b). Transport emissions would also be mitigated by providing temporary housing at the construction location, minimizing the number of trips to and from the job sites. Based on the estimated emissions per vehicle from Table 1, the number of vehicles operating in the park yearly, and the dominant daily winds, impacts to air quality would be negligible and within state and federal standards. The Class II air quality designation for Padre Island National Seashore would not be affected by the proposal. Further, because the Class II air quality would not be affected, there would be no unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because there would be no effects on air quality, and the proposed actions would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Soundscape Management

In accordance with 2006 *Management Policies* and Director's Order-47 *Sound Preservation and Noise Management*, an important component of the National Park Service's mission is the preservation of

natural soundscapes associated with national park units (NPS 2006). Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among National Park Service units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

The proposed location for the two new patrol cabins and all construction activity would occur in a zone of the park that is currently accessible by park visitors and their vehicles. The dominate sound source is the crashing of the surf, other sounds in this area are most often generated from vehicular traffic (visitors and employees entering/leaving the National Seashore), people, boats, nonfederal oil and gas exploration and development, grounds-keeping equipment, climate controls equipment on the buildings, some wildlife such as birds, and wind. Sound generated by the long-term operation of the patrol cabins may include people using the building and vehicles coming and going. Because the areas already contain man-made noises, the long-term operation of the cabins and Headquarters incubation facilities is not expected to appreciably increase the noise levels in the general areas.

The existing sounds in the Headquarters area where the incubation facility expansion will be built are most often generated from vehicular traffic, visitors and employees entering/leaving the area, people talking, grounds-keeping equipment, climate control equipment on the buildings, some wildlife such as birds, and the wind.

During construction, human-caused sounds would likely increase due to construction activities, equipment, vehicular traffic, and construction crews. Any sounds generated from construction would be temporary, lasting only as long as the construction activity is generating the sounds, and would have a negligible to minor adverse impact on visitors and employees. Further, such negligible or minor impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Lightscape Management

In accordance with 2006 *Management Policies*, the National Park Service strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). Padre Island National Seashore strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. The National Seashore also strives to ensure that all outdoor lighting is shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky. The visitor center and the existing headquarters facility are the primary sources of light in the National Seashore.

The proposed action may incorporate minimal exterior lighting on the cabins and incubation facility expansion but the lighting would be directed toward the intended subject with appropriate shielding mechanisms and would be placed in only those areas where lighting is needed for safety reasons. This concern has been considered and addressed with other facilities placed along the beach, as the potential of artificial light to negatively affect hatchling sea turtles is well documented. The amount and extent of exterior lighting on the two new proposed sea turtle patrol cabins and headquarters incubation facility expansion would have negligible effects on the existing outside lighting or natural night sky of the area. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Socioeconomics

The proposed action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the proposed action could provide a negligible beneficial impact to the economies of nearby Corpus Christi, Texas as well Nueces County due to minimal increases in employment opportunities for sea turtle patrollers and revenues for local businesses and governments generated from these additional construction activities and materials obtained. Any increase in workforce and revenue, however, would be temporary and negligible, lasting only as long as construction. Because the impacts to the socioeconomic environment would be negligible, this topic is dismissed.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), and is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to the NRCS, the project area does not contain prime or unique farmlands (NRCS 2003). Because there would be no effects on prime and unique farmlands, this topic is dismissed from further analysis in this document.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by the Department of Interior agencies be explicitly addressed in environmental documents. The Federal Indian Trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources at Padre Island National Seashore. The lands comprising the National Seashore are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Because there are no Indian trust resources, this topic is dismissed from further analysis in this document.

Environmental Justice

Executive Order 12898 *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Because the new patrol cabins and Headquarters incubation facility expansion would be available for use by all staff of the park's Division of Sea Turtle Science and Recovery regardless of race or income, and the construction material suppliers would not be purchased based on their race or income, the proposed action would not have disproportionate health or environmental effects on minorities or low-income populations or communities. Because there would be no disproportionate effects, this topic is dismissed from further analysis in this document.

Climate Change and Sustainability

Although climatologists are unsure about the long-term results of global climate change, it is clear that the planet is experiencing a warming trend that affects ocean currents, sea levels, polar sea ice, and global weather patterns. Although these changes are likely to affect winter precipitation patterns and amounts in the parks, it would be speculative to predict localized changes in temperature, precipitation, or other weather changes, in part because there are many variables that are not fully understood and there may be variables not currently defined. Therefore, the analysis in this document is based on past and current weather patterns and the effects of future climate changes are not discussed further.

ALTERNATIVES

During January 2010, an interdisciplinary team of National Park Service employees met for the purpose of developing project alternatives. This meeting resulted in the definition of project objectives as described in the *Purpose and Need,* and a list of alternatives that could potentially meet these objectives. A total of four action alternatives and the no-action alternative were originally identified for this project. Of these, three of the action alternatives were dismissed from further consideration for various reasons, as described later in this chapter. One action alternative and the no-action alternative are carried forward for further evaluation in this environmental assessment. A summary table comparing alternative components is presented at the end of this chapter.

Alternatives Carried Forward

Alternative A – No-Action

Under this alternative, the two new sea turtle patrol cabins and the headquarters incubation facility expansion would not be constructed. The existing sea turtle patrol cabin at the park's 39-mile mark would continue to provide biological technicians overnight accommodations and other support functions. The Headquarters incubation facility would continue to provide office space, lab facilities and incubation services. The current cabin with accommodations for six would remain in its present condition, and the Division of Sea Turtle Science and Recovery would not expand their backcountry patrol operations. The operation facilities would not be relocated and the efficiency and safety of the sea turtle recovery program would not be improved. Should the no-action alternative be selected, the National Park Service would respond to future needs and conditions of the sea turtle recovery program as it does now, without major actions or changes than the present course of action. See Figure 2 for a map of existing cabins placement.

Alternative B – Construct Two New Sea Turtle Patrol Cabins and Expand the Headquarters Incubation Facility

This alternative consists of constructing two new sea turtle patrol cabins along the Gulf of Mexico shoreline in Kenedy County, Texas, at Padre Island National Seashore's 30 and 50-mile mark locations, i.e., respectively ten and thirty miles north of the Port Mansfield channel and to expand the current incubation facility at the Headquarters compound. This proposed action would restore the sea turtle program's original two cabins, which were destroyed by Hurricane Brett in 1999 and meet the needs created by the success of the Turtle protection and restoration program. The following text further describes the components of Alternative B:

- **Cabin Features** – The new sea turtle patrol cabins would be general wood stud (–stick‖) construction, elevated on pilings, each approximately 2,500 square feet in size. Rough dimensions for the new cabin design are 50 feet wide by 40 feet long, with a 10 feet deep deck, making the total footprint for the building to be 50 feet by 50 feet. The interior of the building would include sleeping quarters for up to 23 people, two full bathrooms, a kitchen, office and living space, storage area, and basic operational space to support the program. With the remote backcountry location for the cabins, they would be equipped with solar powered photovoltaic cells to provide a small amount of electricity for lighting and communications. Propane gas would power the stove and cool the refrigerator. A fire protection system for the cabins would consist of smoke alarms, with fire exits in the building. The cabins would not be equipped with modern climate control systems, i.e., there would be no heating, ventilation, or air conditioning (HVAC) included. Since the cabins are for a specialized use and are not open to the public, they would not be American Disability Act compliant. See Figure 1 for a layout of the proposed cabin.

- **Headquarters Incubation Facility Expansion-**

  The expansion of the incubation facility would consist of two buildings built to withstand hurricane force winds of 170 mile per hour. These buildings would be elevated on pilings. One building would be a new incubation room, designed to hold eggs during the last third of incubation, a time when it is critical to regulate temperatures generated by the developing eggs. This building will be cooled with a 2.5 ton HVAC, where a 60,000 BTU propane air handler will supply heat. The second building would provide expanded office space, a storage area and a mechanical room. This second building will be cooled with a 3 ton HVAC and an 80,000 BTU propane air handler will provide heat. Lighting for both buildings will be high efficiency LED fixtures. Both buildings will be ADA compliant. See Figure 2 for the layout of the proposed incubation facility expansion.

- **Use/Operation of the Facility** – The new cabins and Headquarters incubation facility expansion would be solely used by park employees for the function of sea turtle science and recovery; however, in the case of a special event outside of the sea turtle season, special operations could acquire the use of these facilities. The cabins would be geographically placed for better placement along the Gulf of Mexico beach. This would allow for less time traveling to and from the patrollers' survey areas each day, as well as offer closer shelter or refuge should the event of foul weather or a dangerous situation arise on the backcountry beach. An area near the cabins would be designated to contain or "corral" sea turtle eggs, which would be collected for incubation, hatching, and release. Having the corrals in the proposed areas would reduce the sea turtle eggs that were collected in the southern part of the park time of transport and time in the vehicle; therefore reducing the risk of injury or damage to the viable eggs. This incubation coral would be a fenced-locked area, as similar to pre-existing corrals being used by the program. This corral would be similar to the 20 feet by 45 feet coral as found at the current sea turtle patrol cabin for the 2010 sea turtle nesting season, but the size of the corrals would be enlarged with success of the program. The current sea turtle patrol cabin in place would be converted over to be used by law enforcement for border security and visitor safety related issues. Like the current cabin in place, the National Seashore would not offer visitor services in the new patrol cabins or the incubation facilities; however, the cabins could become made available for other park-specific business such as scientific research. See Figure 3 for maps of the park with only the existing cabin against the park with the proposed cabins.

- **Access** - The National Seashore allows for beach driving; therefore, access to the new sea turtle patrol cabins would be via the Gulf of Mexico shoreline. Access to the Headquarters area via Park Rd 22.

- **Revegetation** – The existing forbs and grasses in the project area would be preserved to the extent possible. All areas disturbed by construction of the new sea turtle patrol cabins would be revegetated and recontoured to the style of the native landscape. Native vegetation, topography, or other natural features would be used, as appropriate. The area disturbed by construction of incubation facility expansion would be leveled and reseeded with native grasses.

- **Temporary Housing** – A temporary housing facility (travel trailer) would be located at the project areas during construction. This would allow for all eight to ten hours of work time to be applied to construction of the cabins, rather than time being spent commuting to the project areas. After completion of the cabins, the travel trailer would be removed from each of the project areas. Currently, the areas where the temporary housing facility would be are sites available to visitors for backcountry camping.

- **Construction Staging** – To implement this alternative, an area near each of the proposed sites for the new sea turtle patrol cabins would be designated for construction staging, material stockpiling, and equipment storage. These areas would likely be sited in areas somewhere along the Gulf of Mexico beach, where disturbances from beach driving and tidal flows already occur. The staging areas would be designated in areas that would neither impede beach vehicle traffic nor pose a collision safety risk to visitors', contractors', and park staff's vehicles.

This alternative is based on preliminary designs and best information available at the time of this writing. Specific distances, areas, and layouts used to describe the alternative are only estimates and could change during final site design. If changes during final site design are inconsistent with the intent and effects of the selected alternative, then additional compliance would be completed, as appropriate.

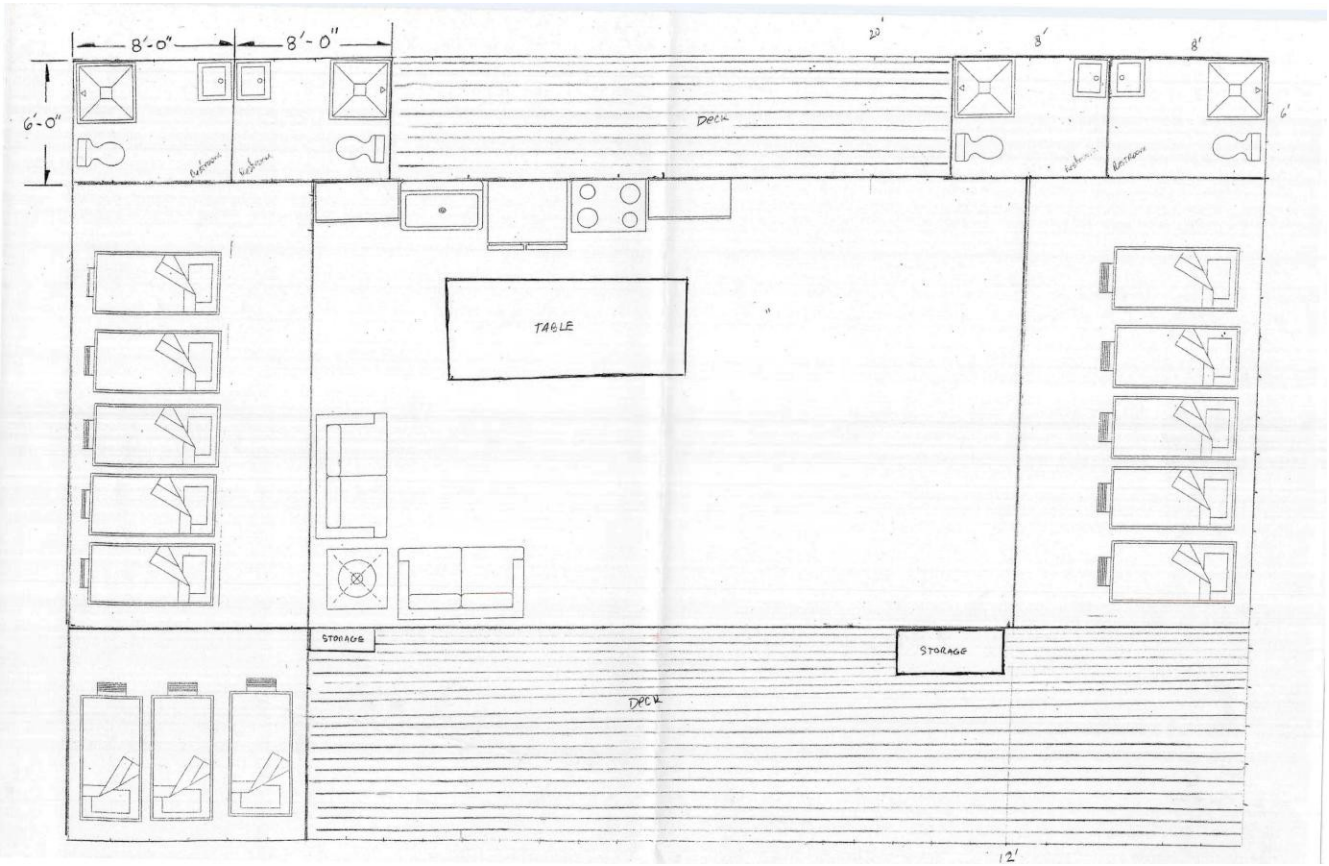


Figure 3 - Proposed cabin floor plan

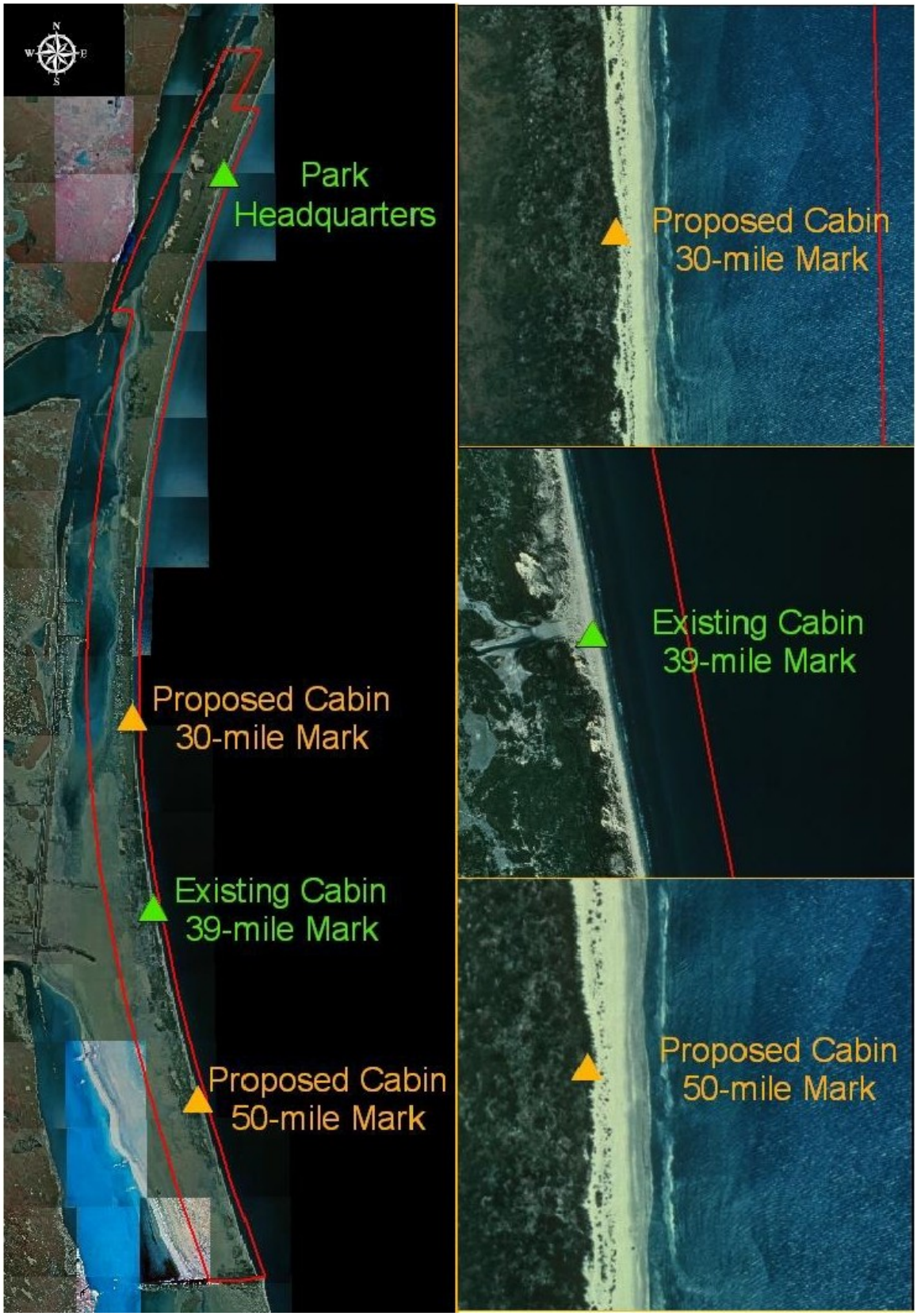
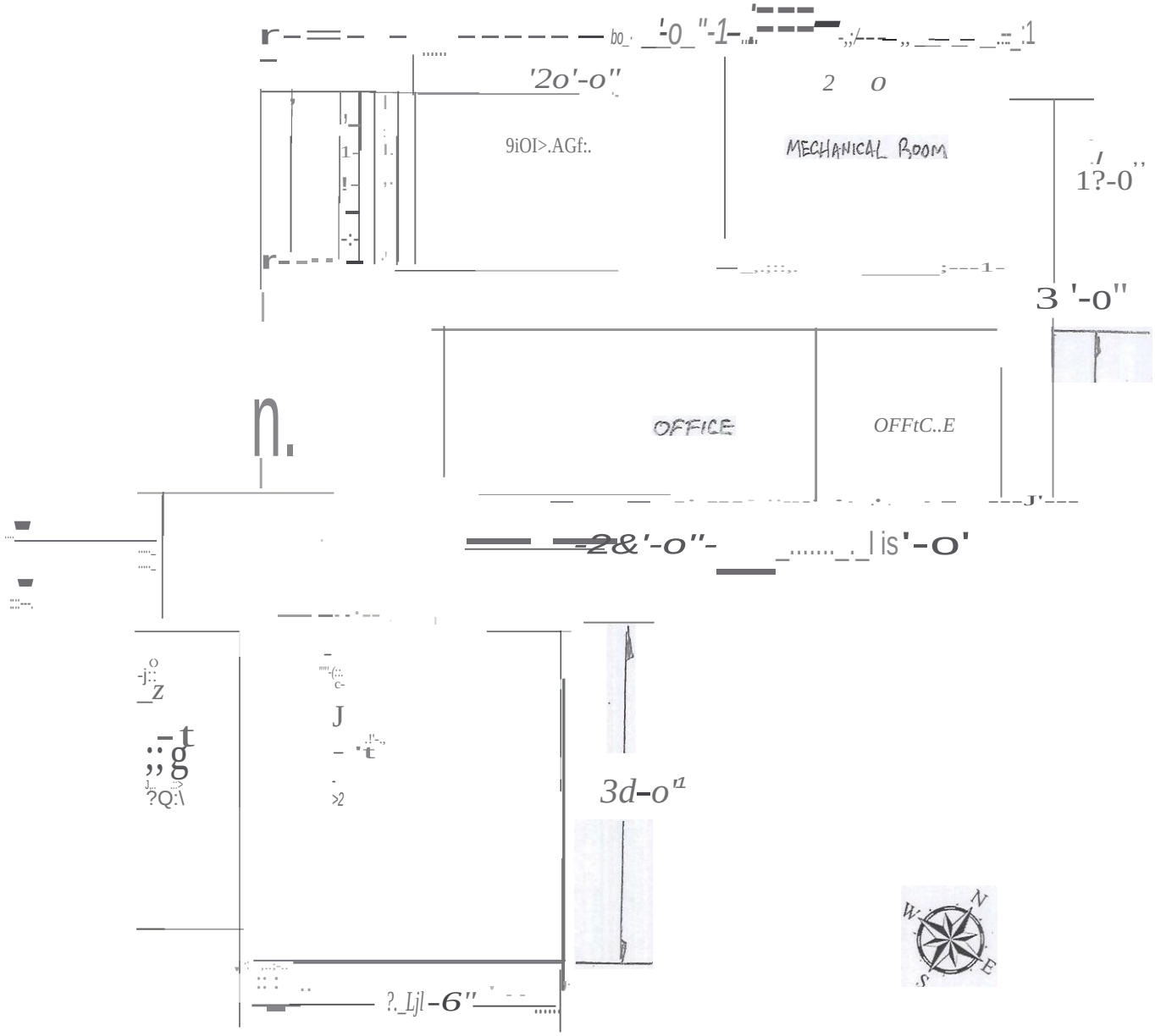


Figure 4– Alternative B, Construct New Sea Turtle Patrol Cabins



Proposed Expansion of Headquarters Incubation Facility

Figure 5 -Floor Plan of the Headquarters Incubation Facility Expansion



Figure 5- Current Sea Turtle Lab with Proposed Lab Expansion

Mitigation Measures

The following mitigation measures were developed to minimize the degree and or severity of adverse effects and would be implemented during construction of the action alternative, as needed:

- Construction activities would be scheduled to minimize construction-related impacts upon visitors. Areas not under construction would remain accessible to visitors as much as is safely possible.
- The National Seashore's facility manager would be responsible for ensuring that their crew performs the necessary work in accordance with instructions and standards provided by the NPS.
- The NPS would coordinate with contractors and any volunteers to monitor construction activities per NPS standards. Specifically, the National Seashore would monitor and or direct vehicles transporting materials to their designated locations.
- All crew members, contractors, and volunteers assisting with work efforts would be educated about the importance of avoiding impacts to sensitive resources that have been flagged for avoidance, which may include natural and cultural resources.
- An archaeological survey would be performed prior to any construction; however, should construction unearth previously undiscovered cultural resources, work would be stopped in the area of discovery and the recreation area would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to 36 CFR 800.13, *Post Review Discoveries*. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.
- To minimize the amount of ground disturbance, staging and stockpiling areas would be in previously disturbed sites, away from visitor use areas to the extent possible. All staging and stockpiling areas would be returned to pre-construction conditions following construction.
- Construction zones would be identified and fenced with construction tape, silt fencing, or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.
- Revegetation and recontouring of disturbed areas would take place following construction and would be designed to minimize the visual intrusion of the structure. Revegetation efforts would strive to reconstruct the natural spacing, abundance, and diversity of native plant species using native species. All disturbed areas would be restored as nearly as possible to pre-construction conditions shortly after construction activities are completed. Weed control methods would be implemented to minimize the introduction of noxious weeds. Some shrubs and grasses would be removed, but other existing vegetation at the site would not be disturbed to the extent possible. A monitor would be onsite for identification and protection of any rare, protected plant species.
- Because disturbed soils are susceptible to erosion until revegetation takes place, standard erosion control measures such as silt fences and/or sand bags would be used to minimize any potential soil erosion.
- Fugitive dust generated by construction would be controlled by spraying water on the construction site, if necessary.
- Employees and construction crews would be required to park their vehicles on the beach, away from the flow of beach driving traffic to ensure enough capacity and access to the National Seashore for visitors.

- To reduce noise and emissions, construction equipment would not be permitted to idle for long periods of time.
- To minimize possible petrochemical leaks from construction equipment, the contractor would regularly monitor and check construction equipment to identify and repair any leaks.
- Construction workers and supervisors would be informed about special status species. Contract provisions would require the cessation of construction activities if a species were discovered in the project area, until park staff re-evaluates the project. This would allow modification of the contract for any protection measures determined necessary to protect the discovery. A monitor would assist for identification of special status species.
- Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of any discovery and the National Seashore would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, *Post Review Discoveries*. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.
- The National Park Service would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging paleontological materials, archeological sites, or historic properties. Contractors and subcontractors would also be instructed on procedures to follow in case previously unknown paleontological or archeological resources are uncovered during construction.
- To minimize the potential for impacts to nesting sea turtles, a trained escort would accompany and lead vehicles down beach. Construction vehicles traveling to construction sites would coordinate times of work so convoys may be implemented.
- Construction workers and supervisors would be informed about the special sensitivity of the National Seashore's values, regulations, and appropriate housekeeping.
- According to 2006 *Management Policies*, the National Park Service would strive to construct facilities with sustainable designs and systems to minimize potential environmental impacts. Development would not compete with or dominate monument's features, or interfere with natural processes, such as the seasonal migration of wildlife or hydrologic activity associated with wetlands. To the extent possible, the design and management of facilities would emphasize environmental sensitivity in construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. The National Park Service also reduces energy costs, eliminates waste, and conserves energy resources by using energy-efficient and cost-effective technology. Energy efficiency is incorporated into the decision-making process during the design and acquisition of buildings, facilities, and transportation systems that emphasize the use of renewable energy sources.

Alternatives Considered and Dismissed

The following three alternatives were considered for project implementation, but were ultimately dismissed from further analysis (the last bullet is a combination of the first two alternatives). Reasons for their dismissal are provided in the following alternative descriptions. Each of these alternatives which were considered but dismissed consisted of using the pre-existing sea turtle patrol cabin.

- **Expansion of Current Sea Turtle Patrol Cabin without Expanding the Headquarters Incubation Facility –** This alternative consisted of utilizing the current patrol cabin in place, but expanding it so the park could accommodate the successful sea turtle program and its need for

additional patrollers. This alternative would have consisted of no ―new‖ construction, and no additional buildings would have been constructed. This alternative would have caused patrollers to commute each morning and evening, at the beginning and end of their patrols, to their designated survey areas as they do currently. The added fuel expense and carbon footprint driving the sea turtle monitor vehicles (UTVs) would be higher than the preferred alternative. Also, this does not allow for expansion of the Headquarters incubation facilities or the sea turtle egg incubation corrals to be placed at supervised locations at the park's 30 and 50-mile mark locations. The only corral would then be where it is today at the current cabin; therefore, causing longer transport of eggs in vehicles, which could lead to egg injury or loss. The capacity of the Headquarters incubation facility would quickly reach capacity requiring less than optimal spacing of incubation containers within the existing facility. Temperature control would not be optimal and hatching success would be reduced. This alternative of expanding only the current turtle patrol facility was eliminated for feasibility reasons and because the alternative would not meet the project's objectives.

- **Construction of Only One Sea Turtle Patrol Cabin with Current Cabin –** This alternative consisted of leaving the current sea turtle patrol cabin in its current place, and supplementing it with another patrol cabin in another location. This alternative was seriously considered to keep costs down for construction; however, this alternative was dismissed for reason of the need for specific geographic positioning of the cabins, improving efficiency of the recovery program's survey efforts, safety, as well as better placement of egg incubation corrals. Additional space in the Headquarters incubation facility would still be needed in the near future. This alternative would have offset the cabins by ten miles from the preferred locations. This alternative also does not address the need for expanding the current lab facilities.
- **Construction of Only One Sea Turtle Patrol Cabin, but also Expanding Current Cabin –** This alternative consisted of combining the two preceding alternatives; however, for reasons of dismissing the two prior, this alternative was not selected.
- **Construction of Only the Headquarters Incubation Facility –** This alternative does not meet the majority of the objectives for this project. It would not accommodate the increase of personnel, and it would not increase the safety of the program for park staff and sea turtle egg embryo.

Alternative Summaries

Table 2 summarizes the major components of Alternatives A and B, and compares the ability of these alternatives to meet the project objectives (the objectives for this project are identified in the *Purpose and Need* chapter). As shown in the following table, Alternative B meets each of the objectives identified for this project, while the No Action Alternative does not address all of the objectives.

Table 2 **–** Summary of Alternatives and How Each Alternative Meets Project Objectives

Alternative Elements	Alternative A – No Action	Alternative B – Preferred
Cabins and Living/Operational Space	The existing sea turtle patrol cabin would continue to function as employee accommodations, and the cabin and Headquarters facility would continue to provide operational space for the sea turtle science and recovery program.	Two new cabins would be constructed, measuring roughly 2,500 square feet each. Construction of the cabins would offer overnight accommodations for the additional staff that would be needed by the expanding program. The old sea turtle cabin would be decommissioned by the sea turtle program, and all backcountry patrol staff's accommodations would be moved to the two new cabins. The old cabin would be gifted to law enforcement, providing support for backcountry

		safety and protection. The Headquarters lab expansion would provide additional work space for increased personnel, while the incubation facility expansion would accommodate the demand for additional hatching capacity.
Sea Turtle Egg Facilities	The incubation corral located at the current cabin would remain, and no additional backcountry corrals would be constructed. Vehicles would continue to transport eggs to the current corral, causing some clutches to be transported more than 20 miles across extremely difficult driving conditions and rough terrain.	Two new incubation corrals could be constructed in the park's backcountry, providing egg incubation deposition locations for egg transports at intervals no more than approximately 10 miles apart; therefore, reducing the duration of time the eggs would be handled, and the amount of rough terrain the eggs would need to be transported across. Time of movement after laying may cause a significant decrease in relative hatching success. The Headquarters incubation facility would be expanded which would provide sufficient space for current and future incubation and staff needs.
Access and Operational Efficiency	The cabin would continue to be the start and end points for backcountry patrol surveys each day, with access to the cabin via the Gulf beach. Commuting to the patrollers' survey areas would be necessary at the start and end of each day. Access to Headquarters and the current incubation lab would continue via Park Road 22.	Construction of the new cabins would provide closer access for the backcountry patrol survey areas at the start and end of each day. Offering closer access provides for a more efficient program by reduction of demands on utility terrain vehicles (UTVs) and fuel for patrols, as well as offering less time commuting to and from survey areas each day. Staff working in the Headquarters incubation facilities expansion would access the facility from Park Road 22 and would park their vehicles in the existing parking area within the Headquarters complex.
Employee Safety	Operations and activities would continue as they do in their present form, and safety would continue to be considered highest priority and applied as indentified in current, up-to-date protocols. The existing cabin would remain the only shelter in the backcountry beach to offer refuge during times of need.	The two new cabins would offer two additional locations for backcountry patrollers to take refuge from inclement weather, or could potentially offer solace from a dangerous situation arising within the park. The new cabins would contain first aid and first responder supplies. The existing sea turtle cabin would be decommissioned and gifted to the park's Division of Visitor Safety and Resource Protection; therefore, increasing opportunities for Protection Rangers' and emergency medical technicians (EMTs) presence on the Gulf beach. The expanded Headquarters incubation facility would provide sufficient working space for

		current and future staff. Currently, working spaces are shared and overcrowded.
Visitor Safety	Safety would continue to be considered highest priority and applied as indentified in current, up-to-date protocols.	The new cabins would contain first aid and first responder supplies, as well as offer a place where visitors may be able to locate park staff and communications during a time of need. The present sea turtle cabin would be decommissioned and gifted to the park's Division of Visitor Safety and Resource Protection; therefore, increasing opportunities for Protection Rangers' and emergency medical technicians (EMTs) presence on the Gulf beach.
Project Objectives	**Meets Project Objectives?**	**Meets Project Objectives?**
Provide facilities that would support the sea turtle program's demands for increased overnight accommodations and increased area for controlled incubation, along with additional office space.	No. The cabin would not accommodate the extra backcountry patrollers. The Current incubation facilities would not accommodate future need incubation services and office space.	Yes. Two new sea turtle patrol cabins would provide the additional overnight accommodations for the increase in the program's personnel number. The expanded headquarters incubation facility would provide sufficient space for incubating addional eggs produced by program success and working space for staff needed to take care of the eggs.
Provide improved employee safety.	No. Operations and activities would continue as they do in their present form, and safety would continue to be considered highest priority and applied as indentified in current, up-to-date protocols. The existing cabin would remain the only shelter in the backcountry beach to offer refuge during times of need. Staff working in the Headquarters incubation facility would still have to share work spaces designed for single employees.	Yes. The two proposed cabins would offer two additional locations for backcountry patrollers to take refuge from inclement weather, or could potentially offer solace from a dangerous situation arising within the park. The new cabins would contain first aid and first responder supplies. The present sea turtle cabin would be decommissioned and gifted to the park's Division of Visitor Safety and Resource Protection, therefore offering better opportunities for Protection Rangers' increased presence on the beach. The expanded headquarters incubation facility would provide sufficient space for employees to work in uncrowded, safe areas.
Provide opportunities for better sea turtle egg incubation facilities within safe transport distances (time) for eggs.	Unknown. With unknown safe distances for sea turtle egg vehicle transport across rough terrain, the best estimates the park has for the current location for the incubation corral is considered –far‖ while transporting eggs during times of poor beach driving conditions. Time of moving eggs after laying may cause a significant decrease in relative hatching success (Limpus 1979).	Yes. Distances of sea turtle egg transport would be reduced by more than 50% of the distance of current condition. Reducing the eggs transport time equates to reducing the duration of eggs handled, therefore reducing the potential for eggs to be injured or destroyed from movement.
Provide efficient access	Yes and No. The existing cabin is	Yes. The new cabins would replace the

locations for park staff to facilitate the sea turtle program's daily patrol operations.	more convenient for facilitating backcountry patrols compared with starting out at the park's headquarters; however, the daily commutes to and from patrollers' survey areas are inefficient.	current cabin, providing more convenient, efficient survey start and end point locations for the program's operations. The increased efficiency for this action would reduce fuel demands, lowering park expenses, the park's carbon footprint, and maintenance needs in relation to the miles surveyed and applied to sea turtle patrols. Park personnel would also be applying time to monitoring survey areas as opposed to commuting to survey site.
Prevent impairment to park resources and values.	Yes. Without constructing the new cabins and the additional incubation facilities there would be no potential for park resources and values to be impaired.	Yes. With the applied mitigation measures no impairment of park resources and values would result.

Table 3 summarizes the anticipated environmental impacts for alternatives A and B. Only those impact topics that have been carried forward for further analysis are included in this table. The *Environmental Consequences* chapter provides a more detailed explanation of these impacts.

Table 3 **–** Environmental Impact Summary by Alternative

Impact Topic	Alternative A – No Action	Alternative B – Preferred Alternative
Topography, Geology, and Soils	No new disturbance of topography, geology, or soils would occur from this alternative.	Placement and construction of new cabins would require access through dunes, which could result in minor, direct, adverse effects. Any impacts or loss of dune features would be reestablished by re-contouring, reassembling, and through natural processes. Placement of the Headquarters incubation facility expansion allows for access across previously modified surfaces and will not alter the surface from its current condition.
Special Status Species	No new disturbance to special status species would occur from this alternative.	Negligible to minor, direct, adverse effects would occur to piping plovers by disturbance of vehicle while beach driving; however, mitigation measures would address this by minimizing beach travel. The proposed action would have minor to moderate beneficial effects for establishment of the Kemp's ridley sea turtle, as well as all five of the nesting sea turtle species on the National Seashore. Formal Consultation will occur to address any type of take on piping plovers or sea turtle species.
Visitor Use and Experience	No new disturbance of lands would occur under this alternative; therefore, no disturbance to view shed. Negligible effects to visitor safety.	Minor, direct, adverse effects resulting from changes to the view shed, and also from noise generated during construction. The impact to the view shed is expected to be long-term, lasting the duration of the cabins' presence. Beneficial effects to visitors' safety, by providing additional locations where visitors may reach park staff and communications during times of emergency.
Park Operations	Minor, direct, adverse effects resulting from employees working in a less efficient program. The inefficiency could ultimately lead to safety	Minor to moderate, direct and indirect, beneficial effects from an improved work environment that meets health and safety standards. Minor, direct, short-term, adverse effects from time needed for planning and constructing new cabins.

Impact Topic	Alternative A – No Action	Alternative B – Preferred Alternative
	concerns with a direct, minor to moderate, adverse effect.	
Floodplains	No new disturbance to floodplains would occur from this alternative.	Negligible to minor, direct, adverse effects would occur to floodplains from construction of two new sea turtle cabins along the Gulf of Mexico shoreline; however, the two new facilities would be constructed on stilts, placing the facility above storm water velocity elevations.

Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which guides the Council on Environmental Quality (CEQ). The CEQ provides direction that –[t]he environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA's §101:

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
- enhance the quality of renewable resources and approach the maximum attainable recycling of depleatable resources.

Although alternative A, no-action, attains the widest range of beneficial uses of the environment, the risk of health and safety to the National Seashore's employees working in the backcountry is not addressed; therefore, alternative A only minimally meets the above six evaluation factors. This alternative also does not meet the criteria for improving renewable resources because the existing sea turtle patrol operations are less inefficient with regards to energy.

Alternative B is the environmentally preferred alternative because it best addresses these six evaluation factors. Alternative B, *Construction of Two New Sea Turtle Patrol Cabins and expand the Headquarters incubation facility*, would provide a working environment for park staff that meets health and safety recommendations, while minimizing environmental impacts to the extent possible. As a permanent facilities, the new sea turtle cabins and incubation facility would be used by future generations. The new cabins would also be more energy efficient and more environmentally-friendly than the existing sea turtle patrol cabin. The carbon footprint and maintenance cycle would be minimized by reducing commute time of UTVs to and from their specific, daily survey areas.

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Because it meets the purpose and need for the project, the project objectives, and is the environmentally preferred alternative, alternative B is also recommended as the National Park Service preferred alternative. For the remainder of the document, alternative B will be referred to as the preferred alternative.

ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential environmental consequences, or impacts, that would occur as a result of implementing the proposed project. Topics analyzed in this chapter include topography, geology, and soils; special status species; park operations; visitor use and experience; and floodplains. Direct, indirect, and cumulative effects, as well as impairment are analyzed for each resource topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are defined as follows, while more specific impact thresholds are given for each resource at the beginning of each resource section.

- **Type** describes the classification of the impact as either beneficial or adverse, direct or indirect:
  - *Beneficial*: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
  - *Adverse*: A change that moves the resource away from a desired condition or detracts from its appearance or condition.
  - *Direct*: An effect that is caused by an action and occurs in the same time and place.
  - *Indirect*: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.
- **Context** describes the area or location in which the impact will occur. Are the effects site-specific, local, regional, or even broader?
- **Duration** describes the length of time an effect will occur, either short-term or long-term:
  - *Short-term* impacts generally last only during construction, and the resources resume their pre-construction conditions following construction.
  - *Long-term* impacts last beyond the construction period, and the resources may not resume their pre-construction conditions for a longer period of time following construction.
- **Intensity** describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because definitions of intensity vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this environmental assessment.

Cumulative Impact Scenario

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative impacts in the decision making process for federal projects. Cumulative impacts are defined as "the impact on the 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" (40 CFR 1508.7). Cumulative impacts are considered for both the no-action and preferred alternative.

Padre Island National Seashore's development consists of the Malaquite Visitor Center and concession facility, the park headquarters, two park residences, a 40-site recreational vehicle and tent campground, a hazardous waste facility, a wastewater treatment facility, Bird Island Basin and Yarborough Pass visitor use areas, a 185' communications monopole, and a 1 mile paved Grasslands Nature Trail. The paved, two-lane Park Road 22 provides access into the park, westward to Bird Island Basin, and south to the Gulf of Mexico beach. The beach then becomes the primary transportation corridor, 60 miles to the south end of the park. The beach is hard and accessible by both two and four-wheel drive vehicles for the first five miles of Gulf beach, at which point the remaining 55 miles of beach corridor is accessible only by

four-wheel drive vehicles. Access to the park is also available via boat in the Laguna Madre and Gulf shorelines.

In total, existing park development occupies approximately 400 acres or 0.3% of the park. There are no past park developments or activities that continue to impact the park's resources or values. New developments are planned in the future and include the installation of a new 200' communications tower and a new Law Enforcement facility. Park operations that could contribute to impacts on park resources and values include prescribed fires, routine maintenance of the park roads, future park development, park and visitor vehicle use, and public recreational activities such as motor boating, and burning of campfires.

Cumulative impacts were determined by combining the impacts of the preferred alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Padre Island National Seashore and, if applicable, the surrounding region. Because the scope of this project is relatively small, the geographic and temporal scope of the cumulative analysis is similarly small. The geographic scope for this analysis includes actions within the National Seashore's boundaries, while the temporal scope includes projects within a range of approximately ten years. Given this, the following projects were identified for the purpose of conducting the cumulative effects analysis, listed from past to future:

- **Oil and Gas Management Plan, 2000:** The 2000 Oil and Gas Management Plan for Padre Island National Seashore was prepared for the purpose of guiding the management of activities associated with the exploration and development of nonfederal oil and gas within the park. The Oil and Gas Management Plan identifies those park resources and values most sensitive to oil and gas exploration and development disturbance, and defines impact mitigation requirements to protect such resources and values. In order to protect park resources and values, the plan establishes performance standards for oil and gas exploration and development, and it provides pertinent information to oil and gas owners and operators to facilitate compliance with applicable regulations (NPS 2000).
- **Septic System Conversion to Wetland Lagoons, 2001:** The National Seashore converted the septic system from agitation pools to wetland lagoons, benefiting wildlife that use the facility, in addition to lowering operational costs and maintenance of the facility.
- **Development of BNP Petroleum's Peach Pad, 2004:** Two plans of operations with 5 wells were approved and developed at the end of Pan Am Rd. The site consists of a 2.92 acres pad, and a 0.7 mile extension of Pan Am Rd. The site is currently scheduled to be plugged, abandoned, and reclaimed.
- **Development of Fire Management Plan, 2004:** The National Seashore's fire management plan was completed in December 2004. One of the primary actions prescribed by the plan is the reduction of hazardous fuels around the National Seashore's northern end of the park, where urban interface and park developments occur. The prescribed area for fire, the Malaquite Beach Fire Management Unit, encompasses 5,018 acres, consisting of five rotating annual treatment areas that vary in size from a few hundred acres to over 3,300 acres. There are three other fire treatment areas in the Down Island Fire Management Unit, totaling 38,000 acres.
- **Construction of Sea Turtle Lab Facility, 2005:** New Sea Turtle Science offices and incubation laboratory, supporting the recovery of Kemp's ridley and four other sea turtle species.
- **Construction of Communications Monopole, 2005:** Installation of a 185 foot communication monopole at Park Headquarters in 2005 for improved park communication and border related safety issues.
- **Improvements to Bird Island Basin Recreational Area, 2005:** This development included the repair and enlargement of Bird Island Basin's boat ramp and parking facilities. A 0.6 mile road was constructed, separating the boat ramp from the wind surfing facility, while also restoring hydrology to

one of the park's sensitive wind tidal flats. Three vault toilet systems were installed, and a building to facilitate sales was constructed by the National Seashore's wind surfing recreation concessionaire.

- **Development of Kindee Oil and Gas Texas' Wilson Pad and Road, 2006:** The National Seashore is currently awaiting a reclamation plan from Kindee Oil and Gas Texas to restore the 2.6 acre pad and 0.8 mile road. The other approved well has been abandoned by Kindee Oil and Gas.
- **Reclamation of Malaquite Beach Visitors Center's Parking Lot, 2008:** The National Seashore removed 2.3 acres of the over-engineered Malaquite Beach Visitors Center's parking lot. This parking lot was completed in 1969 with expectations of larger numbers of visitors than what the park experiences. Because the parking lot has never been utilized to its full extent, the National Seashore removed approximately one quarter of the area, restoring the area to the natural landscape.
- **Boundary Installation, 2010:** The National Seashore is currently installing buoys for water marking the Laguna Madre boundary to support law enforcement and jurisdiction over wildlife poaching cases.
- **Development of BNP Petroleum Lemon Pad, Ongoing:** The 2002 approved plan of operations was developed in 2008, drilling one of the two wells for this site, consisting of a 2.7 acre pad and a 200 meter road. One well is still permitted and may be developed anytime in the near future.
- **Development of BNP Petroleum DM 11A, ST 991 #1, and ST991 #2, Ongoing:** The 2007 approved plan of operations still has one of three wells that may be developed on this 1.5 acre site.
- **Exotic Vegetation Management, Ongoing:** The National Seashore has been treating its exotic vegetation for the past five years. In fiscal year 2007, stands of *Arundo donax* were treated. Because success is achieved by treating the same areas for 4 to 5 years, future work would focus on maintaining the already treated areas and limiting the number of new areas treated. Currently, Resource Management is having some genetic work completed to determine if the park's *Phragmites australis* is of the old or new world phenotypes.
- **Implementation of the NMFS and USFWS 1992 Recovery Plan for Kemp's ridley Sea Turtle, Ongoing:** The National Seashore continues to comply with Section 7 of the Endangered Species Act and follow guidance of the U.S. Fish and Wildlife Service and National Marine and Fisheries Service Kemp's ridley recovery plan.
- **Reclamation of BNP Petroleum A6 Pad and Road, Ongoing:** The National Seashore is currently awaiting a reclamation plan from BNP Petroleum to restore this site's 0.4 acre pad and the associated 0.3 mile road.
- **Construction of Law Enforcement Ranger Station, Ongoing:** During late winter, 2005, the National Seashore's Law Enforcement and Resources Management facility burnt down due to electrical problems. While Resources Management moved operations into the Administration building at Park Headquarters, Law Enforcement moved to a temporary facility in the Malaquite Visitor Center parking lot. The park has secured funding to build a new facility that will be within the footprint of the temporary facility currently in place. Construction is scheduled to begin in 2011.
- **Maintenance Activities, Ongoing:** Throughout the park unit, regularly-scheduled maintenance activities are conducted to ensure visitor health and safety. These activities have involved infrastructure maintenance and upkeep, such as ensuring water quality and access. Regular repairs to roads and concrete ramps have also occurred on a continuing basis. Regular park facility maintenance is continually occurring at the National Seashore. To ensure historic structures remain in good condition, the NPS continually monitors the condition of the Novillo Line Camp to ensure that if any degradation occurs, funding can be sought to stabilize and repair the structure (NPS

2008a). The potential for impacts to soils, vegetation, park operations, and visitor experience exists from maintenance activities.

- **Increasing Demand for Regional Public Lands; Ongoing:** Padre Island National Seashore is the largest stretch of undeveloped public beach within the United States, providing numerous opportunities for access to diverse, affordable outdoor land- and water-based recreation activities. In the State of Texas, only 3% of total land base is open to the public; this reflects a relative dearth of public recreational opportunities compared to other states (NPS 2007c). Increasing demand for regional public lands can affect visitor use and experience.
- **Reclamation of Non-federal mineral sites, Future:** As wells are plugged and abandoned within the park, reclamation of the pads and road would occur. There is potential for half of the sites to be reclaimed within the next five years.
- **Installation of 200 Foot Communications Tower, Future:** The Department of Homeland Security (DHS) has proposed installing a 200 foot communications tower within the park boundary to better support communications and national security. If developed, the National Seashore would dismantle the current tower and move all park communications to the DHS tower.

Soils, Geology, and Topography

Intensity Level Definitions

The methodology used for assessing impacts to soils, geology, and topography is based on how the project would affect the features for which the structure is significant. To analyze these impacts, all available information on soils, geology, and topography in the park was compiled from personal observations, consultation with other agencies, approved park documents, NRCS Soil Series and Classification Surveys, and USGS landcover classification data. The thresholds for this impact assessment are as follows:

Negligible: Operations would not cause discernible alteration to geologic layers, surficial, and shallow geology. Alteration to soils and geology would be so slight that it would not affect the geology/soils ability to sustain biota, water quality, and hydrology, such that reclamation would not be necessary.

Minor: Operations would cause localized or limited alteration to geologic layers, surficial, and shallow geology. Alteration to soils and geology would affect its ability to sustain biota, water quality, and hydrology, such that reclamation would be achievable within 2 years. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Operations would cause alteration to geologic layers, surficial, and shallow geology. Alteration to soils and geology would affect its ability to sustain biota, water quality, and hydrology, such that reclamation would be achievable within 3-5 years. Mitigation measures, if needed to offset adverse effects, could be extensive but would likely be successful.

Major: Operations would cause substantial alteration to geologic layers, surficial, and shallow geology. Alteration to soils and geology would have a lasting effect on the geology/soil's ability to sustain biota, water quality, and hydrology, such that reclamation could not successfully be achieved. Extensive mitigation measures would be needed to offset any adverse effects and their success could not be guaranteed.

Impacts of Alternative A (No-Action Alternative)

The no-action alternative would have no effects on soils, geology, and topography because the National Seashore would remain unchanged. In particular, the natural processes of the Gulf beach and its

environment would remain unchanged, thereby not affecting the current form of the beach and its surrounding areas.

Impacts of Alternative B (Preferred Alternative)

The preferred alternative would have minor adverse, direct effects to soils, geology, and topography at the National Seashore. The construction of two new sea turtle patrol cabin under the preferred alternative would consist of ground disturbance, which at its largest extant could include the removal or repositioning of a small area of dunes. Sand transport and dune migration would continue to be an issue, so revegetating and routine maintenance would be ongoing. Construction of the incubation facility in the headquarters compound would take place on ground previously disturbed that has not been reclaimed and no new disturbance would be created. This area currently has an engineered caliche base with a maintained native grass and sand burr lawn covering.

Mitigation measures proposed to offset adverse effects would be simple, including measures to ensure that topsoil is preserved, the Gulf beach and dunes are reshaped into the natural contours, and that there is no unnatural erosion of soils. Excavated material would be reused on site. Construction equipment would be thoroughly pressure washed and checked by park resources staff for cleanliness before entering the park. Appropriate erosion control devices would be used during construction to control any runoff.

All impacts would be site-specific, but could be long-term, lasting the duration of the cabins' and the Headquarters incubation facilities presence. If the cabins were ever removed, reclamation would occur naturally within two years. There would be no indirect impacts to soils, geology, or topography from the preferred alternative.

Cumulative Effects: Construction projects continue at the National Seashore, disturbing various amounts of soils, geology, and topography, which can lead to minor amounts of erosion. Rehabilitation efforts and erosion control are standard practice. Additionally, future oil and gas development and visitors traveling off-trail would continue to cause disturbance of soils, geology, and topography. When added to other projects occurring in the park, construction of these two new cabins would cause minor cumulative impacts to soils, geology, and topography.

Conclusion: When combined with other past, present, and foreseeable future actions that would result in impacts to soils, geology, and topography, this alternative would contribute a minor impact to the amount of disturbance to the cumulative scenario. Because there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Padre Island National Seashore; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's resources or values.

Special Status Species

Intensity Level Definitions

The methodology used for assessing impacts to special status species is based on how the project would affect the features for which the structure is significant. To analyze these impacts, all available information on special status species in the park was compiled from park documents, outside research, and Federal (USFWS) and State (TPWD) species lists. The thresholds for this impact assessment are as follows:

Negligible: Impacts would result in a change to a population or individuals of a special status species, but the change would be well within the range of natural fluctuations.

Minor: An action that would affect a few individuals of a special status species or have very localized impacts upon their habitat. The change would have barely perceptible consequences to the species or habitat function. Sufficient habitat would remain functional to maintain species viability. Impacts would be outside of critical

reproduction periods. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: An action that would cause measurable effects on: (1) a relatively small percentage of the species population, (2) the existing dynamics between multiple species (e.g., predator-prey, herbivore-forage, vegetation structure-wildlife breeding habitat), or (3) a relatively large habitat area or important habitat attributes. A population or habitat might deviate from normal levels under existing conditions, but would remain indefinitely viable within the preserve. Response to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, or other factors impacting short-term population levels. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful.

Major: An action that would have drastic and permanent consequences for a species population, dynamics between multiple species, or almost all available unique habitats. A population or its habitat would be permanently altered from normal levels under existing conditions, and the species would be at risk of extirpation from the preserve. Frequent responses to disturbance by some individuals would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a decrease in population levels. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

Affected Environment

Under the Endangered Species Act of 1973 (ESA), the NPS has responsibility to address impacts to Federally-listed, candidate, and proposed species. Also, NPS policy requires that State-listed species, and others identified as species of management concern by the park, are to be managed in parks in a manner similar to those that are Federally-listed.

A letter from Texas Parks and Wildlife Department (TPWD), dated March 15, 2010, was received by the park with recommendations concerning rare species and lighting of the cabins. The species identified by the TPWD include: brown pelican (*Pelicanus occidentalis*), northern aplomado falcon (*Falco femoralis septentrionalis*), piping plover (*Charadrius melodus*), sheep frog (*Hypopachus variolosus*), south Texas siren (large form) (*Siren sp. 1)*, peregrine falcon (*Falco peregrinus*), reddish egret (*Egretta rufescens*), white-faced ibis (*Plegadis chihi*), white-tailed hawk (*Buteo albicaudatus*), spot-tailed earless lizard (*Holbrookia lacerata*), and the succulent plant, roughseed sea-purslane (*Sesuvium trianthemoides*). Of these species, all have been documented within the park except the two amphibian species, sheep frog and south Texas siren. Both of these species are listed as Threatened by TPWD. One other State-listed Threatened species which is not documented as being within the National Seashore, but could be occurring is the scarlet snake (*Cemophora coccinea*).

Padre Island National Seashore does not have any critical habitat designated within the park. According to a March 1, 2010 listing of federally protected species and the Texas Parks and Wildlife Department's website (http://www.tpwd.state.tx.us/huntwild/wild/species/endang/index.phtml), 47 listed Federal and/or State protected species potentially occur at the National Seashore (Appendix A). Of these, the 25 species that have actually been documented at Padre Island National Seashore are listed in Table 4 below. The remaining 22 species have either not been documented and/or there is not suitable habitat within the park.

Table 4 – State and Federally-listed species known to occur within Padre Island National Seashore

SPECIES	FEDERAL	STATE
(T – Threatened, E – Endangered, C– Candidate, SOC – Species of Concern, and S/A – Similar in Appearance)		
Reptiles and Amphibians		
American Alligator (*Alligator mississippiensis)*	T (S/A)	

SPECIES	FEDERAL	STATE
Atlantic Hawksbill Sea Turtle (*Eretmochelys imbricata*)	E	E
Green Sea Turtle (*Chelonia mydas)*	T	T
Kemp's Ridley Sea Turtle *(Lepidochelys kempii)*	E	E
Loggerhead Sea Turtle (*Caretta caretta)*	T	T
Leatherback Sea Turtle (*Dermochelys coriacea*)	E	E
Spot-tailed Earless Lizard (*Holbrookia lacerate*)		SOC
Texas Horned Lizard (*Phrynosoma cornutum*)	SOC	T
Texas Indigo Snake (*Drymarchon melanurus erebennus)*		T
Texas Tortoise		T
Birds		
Eastern Brown Pelican (*Pelecanus occidentalis*)	Delisted	T
Reddish Egret (*Egretta rufescens*)	C	T
White-faced Ibis (*Plegadis chihi*)	C	T
Wood Stork (*Mycteria americana*)		T
Sooty Tern (*Sterna fuscata*)		T
Piping Plover (*Charadrius melodous*)	T	T
Bald Eagle (lower 48 states) (*Haliaeetus leucocephalus*)		T
Northern Aplomado Falcon (*Falco femoralis septentrionalis*)	E	E
Swallow-tailed Kite (*Elanoides forficatus*)		T
White-tailed Hawk (*Buteo albicaudatus*)		T
American Peregrine Falcon (*Falco peregrines anatum*)	Delisted	T
Cerulean Warbler *(Dendroica cerulea)*	T	
Black-capped Vireo (*Vireo atricapillus*)	E	E
Tropical Parula (*Parula pitiayumi*)	C	T
Plants		
Roughseed Sea-purslane *(Sesuvium trianthemoides)*	C	SOC
Slender rush-pea (*Hoffmannseggia tenella*)	E	

Impacts of Alternative A (No-Action Alternative)

The no-action alternative would have no effects on special status species because the National Seashore would remain unchanged. In particular, the natural processes of the Gulf beach and its environment would remain unchanged, thereby not affecting the Gulf beach and the species using it.

Impacts of Alternative B (Preferred Alternative)

The following threatened or endangered species do not occur within the proposed construction site due to unsuitable habitat and therefore would not be affected by the proposed action: American alligator, wood stork, bald eagle, white-tailed hawk, swallow-tailed kite, cerulean warbler, black-capped vireo, and tropical parula. The proposed construction sites locations do not include habitat utilized by these species; however, in the case of an accidental or vagrant species, the impacts caused by construction traffic would be negligible, lasting only as long as required for the vehicle to pass. In addition, due to the rarity of these species occurring at the proposed site locations, impacts from construction activities would be negligible and short term, lasting only the duration for time of construction.

The Cerulean Warbler, Black-capped Vireo, and Tropical Parula are neotropical migratory bird species that may be found at park Headquarters during the spring and fall migration. These species do not reside

at the park for longer than a few days as they rebuild fat stores and gather enough energy to continue migration. If present at park Headquarters, these species are located in the common reed and giant reed vegetation located on the north side of Headquarters, approximately 200 feet away from the proposed construction site. Construction activities traveling to and from the construction site could have an adverse effect by flushing birds resting in the cane as they pass along the entrance road to park Headquarters. This impact would be negligible and short term lasting only as long as it takes the vehicle to pass. In addition, this effect is no different than other NPS or visitor vehicles that enter and leave the park Headquarters. The proposed construction site for the expansion of the Headquarters incubation facilities and the proposed construction site for the sea turtle patrol cabins does not include habitat utilized by these species.

Northern Aplomado Falcons, Swallow-tailed Kites, and White-tailed Hawks do not generally occur in the area of the proposed construction sites. These species forage for small mammals and reptiles located in grassland communities throughout the park. These species are routinely seen foraging along Park Road 22 despite vehicular traffic traveling along this road. Due to their apparent tolerance for vehicles and pedestrian traffic any impacts from construction traffic would be negligible, lasting only as long as required for the vehicle to pass. In addition, due to the rarity of these species occurring at park Headquarters, impacts from construction activities would be negligible.

American Peregrine Falcons are routinely observed within the park during the fall, winter, and spring seasons. For the past several years, a Peregrine Falcon has utilized the park's radio tower located at the Headquarters to roost. This individual has tolerated vehicular traffic, construction, people, and other bird species without vacating the area. Any impact associated with the construction of the new laboratory would be minimal and short term lasting only as long as the activity. Peregrine Falcons may also be found along the Gulf beach, foraging on shorebirds. Construction activities traveling to and from the proposed sea turtle patrol cabins construction site could have an adverse affect by flushing birds resting or foraging as they pass along the Gulf beach. This impact would be negligible and short term lasting only as long as it takes the vehicle to pass. In addition, this effect is no different than other NPS or visitor vehicles that enter and leave the park Headquarters.

Sooty Terns, Reddish Egrets, White-faced Ibis, and Eastern Brown Pelicans can be found loafing or foraging along the Gulf beach. Construction activities traveling to and from the proposed cabin construction sites would have an adverse affect by flushing birds as they pass along the beach. These individual have tolerated vehicular traffic, construction, people, and other bird species without vacating the area. This effect is no different than other NPS or visitor vehicles that enter and leave the Gulf beach. Any impact associated with the construction of two new sea turtle patrol cabins, i.e., displacement, would be minor and short term lasting only as long as the activity.

Spot-tailed Earless Lizards, Texas Horned Lizards, and Texas Indigo Snakes may be found within the proposed location for the Headquarters incubation facility. As this is within a previously disturbed area, within the common area of the park Headquarters with heavy foot traffic, any impact to these two species is considered negligible. These species have tolerated park staff and visitors, and any impact to them through this action, i.e., displacement, is considered short-term lasting only the duration of construction. These species may also be found at the sites for the proposed cabins. To prevent any type of take on these species, a monitor would be onsite for any sightings for these reptile species; therefore, the proposed action would be negligible and short-term, lasting only the duration for time of construction.

The proposed sites have been surveyed for Roughseed Sea-purslane, and no purslanes, of any variety, were located. As an additional measure, a monitor will be onsite during construction to prevent any take of a listed vegetative species. The proposed construction sites, as well as the sites which would be accessed for this proposed action are not suitable for Slender Rush-pea.

The expansion of the Headquarters incubation facility will have little to no effect on special status species because construction will be within a highly modified area that is heavily used by park staff and provides very little suitable habitat for listed or proposed species. NPS determines that the construction of the Headquarters incubation facility would have no effect to State or Federally-listed threatened and endangered species or their habitat within the park. This determination is based upon a combination of factors. First, the habitat in the action area is not suitable for several of the species identified by U.S. Fish and Wildlife Service (i.e., sea turtles, piping plover). Second, there is an absence of observations for many of the species listed in Appendix B (e.g., Ocelot). Third, the construction site and associated activities would have negligible, short-term impacts on few species that possibly could occur within the construction site. Fourth, discussions with the U.S. Fish and Wildlife Service did not identify a need to enter into the consultation process for the Headquarters incubation facility, only the proposed sea turtle patrol cabins.

As a connected action, the ultimate use of the proposed project would be to locate, incubate, research, and protect sea turtles, all of which are State and Federally-listed species. The new cabins would provide many beneficial effects for each sea turtle species occurring within the park. An existing U.S. Fish and Wildlife Recovery Plan for the Kemp's Ridley sea turtle assigns the task of patrolling for nesting sea turtles and incubating sea turtle eggs located within the park. The incubation facilities proposed under this project would enhance and increase the park's ability to protect sea turtle species and assist with the removal of these species from the Endangered Species list. However, a visit with the U.S. Fish and Wildlife Service (USFWS) on March 16, 2010 indicated that since the proposed action of constructing cabins would occur in areas where endangered sea turtles nest, and since the proposed action would be occurring during the nesting sea turtle season, additional consultation under §7 of the Endangered Species Act is necessary (USFWS 2010). The park and the Corpus Christi USFWS field office have initiated formal consultation, where the National Seashore will develop a biological assessment, and the USFWS will develop a biological opinion. Through the consultation process, impacts to nesting sea turtles will be analyzed.

Mitigation (conservation) measures for the proposed cabin construction to offset adverse effects would be simple, including measures to ensure that (1) fewer miles are driven along the Gulf beach, by placing a travel trailer on the construction site, thereby reducing access miles driven on the Gulf beach; (2) using trained sea turtle monitoring escorts to lead convoys for any large trucks or heavy equipment traversing the Gulf beach, (3) controlling noise and light, with construction activities to occur only between the time of 30 minutes prior to dawn and 30 minutes after dusk; and (4) stockpiling construction materials up and off the beach, thereby allowing for nesting sea turtles uninhibited access to the Gulf beach and dunes. As for expanding the size of the incubation facility, the proposed action of expanding the facility would take place outside of the sea turtle nesting season to avoid impacts to eggs within the current incubation facility. Further detail of mitigation measures will be covered under the *Conservation Measures* section within the National Seashore's biological assessment and the USFWS' biological opinion for this proposed project.

To fulfill requirements of Section 7 of the Endangered Species Act (16 U.S.C. Section 1536(a)(2)), the National Seashore is currently preparing a biological assessment to insure that proposed action is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species. Therefore, the analysis for special status species (i.e., sea turtles and piping plovers) is being carried forward, and the conclusive results, with findings from the NPS and the USFWS, for special status species will be presented within this project's Finding of No Significant Impact (FONSI).

Cumulative Effects: Daily park operations and future construction projects continue at the National Seashore, disturbing various species, which can lead to minor impacts to special status species. Additionally, future oil and gas development, visitor activities, and beach driving will continue to cause disturbance to special status species. When added to other projects occurring in the park, construction of

these two new cabins would cause minor cumulative impacts to the National Seashore's special status species.

Conclusion: When combined with other past, present, and foreseeable future actions that would result in impacts to special status species, this alternative would contribute a minor impact to the amount of disturbance to the cumulative scenario. Because there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Padre Island National Seashore; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's resources or values.

Visitor Use and Experience

Intensity Level Definitions

The methodology used for assessing impacts to visitor use and experience is based on how construction of two new cabins along the Gulf of Mexico shoreline would affect the visitor, including levels of use, recreational experience, and public health and safety considerations. The impact on the ability of the visitor to experience a full range of park resources was analyzed by examining resources mentioned in the purpose and significance statements for the park. The construction of the Headquarters incubation facilities expansion was not used because the area is not open to park visitors and not visible from accessible vantage points. The thresholds for this impact assessment are as follows:

Negligible: Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. Any effects would be short-term. The visitor would not likely be aware of the effects associated with the alternative.

Minor: Changes in visitor use and/or experience would be detectable, although the changes would be slight and likely short-term. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

Moderate: Changes in visitor use and/or experience would be readily apparent and likely long-term. The visitor would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.

Major: Changes in visitor use and/or experience would be readily apparent and have substantial long-term consequences. The visitor would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes.

Impacts of Alternative A (No-Action Alternative)

Under the no-action alternative there would be no change; therefore, as the intensity levels are written above, there would be no effect. However, it can be said, the current backcountry beach of the National Seashore poses a threat to down-island travelers. There could be a direct, long-term, minor to moderate adverse effect on visitor use and experience as a result of visitors' safety while traveling through the backcountry beach. The backcountry beach is remote and visitors would be removed from any emergency medical service or law enforcement, which could pose a threat during times of sickness, injury, inclement weather, or when a dangerous situation arises. While true with any remote setting, in the event of a visitor becoming sick or injured, there is potential for a long duration of time to elapse before the visitor can safely find help or assistance. Visitors need to plan accordingly prior to venturing into the National Seashore's backcountry. Up to 60 miles removed from the nearest source of freshwater, with nearly no available mobile phone service for the entire 60-mile stretch, a poorly planned trip can result in serious injury or death.

Visually, there would be no direct or indirect adverse effects, because the physical features of the National Seashore would remain unchanged. In particular, the Gulf beach would not change, and visitors

would continue to use the beach in its current form. The visual resources of the area would remain unchanged because no new cabins would be constructed.

Impacts of Alternative B (Preferred Alternative)

Visually, implementation of the preferred alternative would have a direct, long-term (duration of the cabins), minor adverse effect to visitor experience. There could be some aesthetic value lost for the project area; however, with nearly 66 miles of Gulf beach for visitors to experience, and with only the Malaquite Visitor Center, the park's communication tower, an information kiosk, and the existing cabin at the 39-mile mark as the only other structures visible from the Gulf beach, there are many miles to experience without sight of any park structures. Therefore, the addition of two small cabins along the Gulf beach would only slightly affect how visitors use or experience the park. To mitigate for this, the location, size, and aesthetics of the new cabins were chosen to blend with the natural surroundings; however, changes to the visual environment would be noticeable. The expansion of the incubation facility at the headquarters compound would not be visible from the Gulf beach or from Park road 22. New construction will be similar in height, color and construction to existing buildings and will not draw the eye of the casual observer.

Direct, temporary, minor adverse impacts to visitor use and experience would result from construction activities. The proposed turtle patroller cabin area is currently used by visitors, and during construction, portions of this area would be limited to visitor use. Noise from construction activities would also adversely affect visitor use and experience; however, all construction-related impacts would be temporary and cease following construction activities. During construction, there would also be additional vehicles being driven along the Gulf beach by park staff. To help mitigate this, a travel trailer would be temporarily set up at the project area, providing overnight accommodations while minimizing additional beach traffic.

The headquarters incubation facility would be constructed in an area that is restricted to visitors and any additional noise created by construction would be beyond the hearing range of visitors. Staff at the headquarters compound may experience some increase in noise level during construction and the availability of parking may be reduced to maintain a safety zone around construction materials and machinery.

As part of the preferred alternative, the existing cabin would be decommissioned by the Division of Sea Turtle Science and Recovery and gifted to the Division of Visitor Safety and Resource and Protection. Because of this action, there would be greater opportunities for visitors during a time of emergency need to either find a law enforcement ranger or locate other park staff at one of the new cabins who could either provide first aid, shelter, or communications, thereby providing additional assistance. As a result, this action would have a minor to moderate beneficial effect on visitor use and experience.

Cumulative Effects: Any construction activity has the potential to affect visitor use and experience. The construction of the two sea turtle patrol cabins would have an adverse effect on the visitor experience as a result of noise and additional vehicle traffic along the Gulf beach. Projects such as road improvements, prescribed fire, exotic vegetation management, and general park maintenance have had or could have an adverse effect on visitor use and experience because of the inconvenience of construction noise, dust, and possible park enclosures. Ultimately, however, these actions would have a beneficial effect on visitor use and experience because of the potential for long-term improvements to the human health and safety aspects of the National Seashore. Additionally, future oil and gas development, visitor activities, and beach driving would continue to cause disturbance to visitor use and experience. When added to other projects occurring in the park, construction of these two new cabins would cause minor cumulative impacts to the National Seashore's visitor use and experience.

Conclusion: Under the preferred alternative, the visual changes to the area from construction of a new building would have a minor adverse effect on visitor experience because while the changes would be

readily noticeable, actual change to visitor use or experience would be slight. Construction disturbances (noise and additional beach traffic) would have a minor, temporary adverse effect to visitor use and experience. The construction of two sea turtle patrol cabins would have a minor to moderate beneficial effect on visitor use and experience. Cumulatively, this alternative would have a minor beneficial effect to visitor use and experience because ultimately this project combined with other past, present, and reasonably foreseeable future actions would benefit a number of visitor resources.

Park Operations

Intensity Level Definitions

Implementation of a project can affect the operations of a park such as the number of employees needed; the type of duties that need to be conducted; when/who would conduct these duties; how activities should be conducted; and administrative procedures. For the purpose of this analysis, the human health and safety of park employees is also evaluated. The thresholds for this impact assessment are as follows:

Negligible: Park operations would not be affected or the effect would be at or below the lower levels of detection, and would not have an appreciable effect on park operations.

Minor: The effect would be detectable, but would be of a magnitude that would not have an appreciable adverse or beneficial effect on park operations. If mitigation were needed to offset adverse effects, it would be relatively simple and successful.

Moderate: The effects would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.

Major: The effects would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public, and be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, could be expensive, and their success could not be guaranteed.

Impacts of Alternative A (No-Action Alternative)

The no-action alternative would have a minor to moderate, direct, adverse effect on park operations at Padre Island National Seashore. The existing sea turtle patrol cabin would continue to be used; therefore, the expansion of facilities, providing overnight accommodations for additional staff, would not occur. Backcountry patrollers would continue to work out of the current patrol cabin, located approximately at the park's 39-mile mark. This location poses the inability to monitor for sea turtle nest efficiently by having the starting and ending points for the daily surveys in non-optimum locations, resulting in lost time, unnecessary fuel and maintenance expenses, and additional carbon emissions.

The existing patrol cabin would continue to provide overnight accommodations for the backcountry sea turtle patrollers and would also continue to provide controlled space where sea turtle eggs are incubated in a predator excluding facility; however, the backcountry sea turtle patrollers would continue to have to travel long distances to reach this controlled incubation facility.

As identified by a NPS advisory board, patrolling the backcountry beach for sea turtles carries risk for the sea turtle patroller. Accidents do occur when driving in the deep sand and uneven terrain of the Gulf beach at the National Seashore. Heat and fatigue are factors of working during the summer months in south Texas, and border related issues and criminal behavior can all pose threats to the backcountry sea turtle patrollers. Under the no-action alternative, the existing patrol cabin would continue to provide shelter and refuge from a dangerous event; however, this would be isolated to the current location of the cabin. In time, this could have a minor to moderate, direct, adverse effect on the employees and operations.

Cumulative Effects: Any project that occurs at the National Seashore has an effect on park operations; therefore, most of the actions listed in the cumulative scenario in the introduction of this chapter would have some degree of effect on employees and park operations. Planning projects such as the development of a fire management plan and planning for improvements to the visitor center typically involve the majority of the National Seashore's staff to contribute their expertise and assistance. Resource management projects such as exotic vegetation management or endangered species management would primarily involve resources staff. Building construction would primarily involve the maintenance staff. Visitor contact, interpretation, and safety activities usually involve rangers and interpretive specialists. Under this alternative, there would be a minor to moderate effect on park operations associated with the current and future use of the existing sea turtle patrol cabin; therefore, there would be a moderate beneficial effect on park operations when considered with other past, present, and reasonably foreseeable future actions.

Conclusion: Under this alternative, the impact of the inability of being able to provide overnight accommodations for additional staff, the inefficiency for starting and ending daily patrol efforts, the additional distance needed to be driven for depositing sea turtle eggs, and the potential for a dangerous situation arising on the backcountry beach, would have a direct minor to moderate adverse effect on park operations and employee health and safety. Cumulatively, these effects would have a moderate beneficial impact on park operations when considered with other past, present, and reasonably foreseeable future actions.

Impacts of Alternative B (Preferred Alternative)

The construction of two new sea turtle patrol cabins and the expansion of the headquarters incubation facilities under the preferred alternative would provide working environment for National Seashore employees that meet current health and safety standards. Under this alternative, backcountry sea turtle patrollers would begin and end their monitoring efforts from each of the proposed cabins. Distributed at two different latitudes of the park, efficiency of the sea turtle program would be maximized because patrollers would not have to overlap other survey sections to reach their scheduled survey section. Division of Sea Turtle Science and Recovery staff would have appropriate spaces to work within the expanded incubation facilities and staff would have greater control over incubation conditions by being able to control environmental conditions at different stages of egg development.

For the purpose of this analysis, the human health and safety of park employees is also evaluated. Under this alternative, there would be potentially up to three locations within the backcountry beach where park staff could find shelter or refuge from inclement weather, fatigue, or a dangerous situation arising along the Gulf beach. In the event of an emergency, park staff could potentially find other park staff, rendezvous, or if necessary, find communications and first aid supplies at one of the cabins. As a result, these impacts could ultimately have a minor to moderate beneficial effect on the health and safety of park employees. ..

Under this alternative, the proposed cabins would also provide for improved working environments for employees of the Division of Sea Turtle Science and Recovery. The new cabins would provide improved work areas for employees, including office space, and improved kitchen and bathroom facilities. The effect would be detectable, and would likely have an appreciable beneficial effect on park operations; therefore, this alternative would have a minor to moderate benefit on park operations.

Other changes related to the construction of two sea turtle patrols cabins would also include the decommissioning of the existing sea turtle patrol cabin and gifting it to the Division of Visitor Safety and Resource Protection. This would provide a backcountry station for law enforcement staff, accommodating down-island activities with overnight provisions

During construction, a construction crew would use a temporary trailer for overnight accommodations at the project locations. This action would expedite construction time by removing the associated travel

time to project locations, while also mitigating the amount of park traffic and associated impacts of beach driving. This would temporarily disrupt employee efficiency to a minor degree. The typical work load for employees would also be increased during implementation of this project from the need to finalize project plans and complete construction. Should this alternative be carried forward, normal workloads and patterns are expected to return once construction is completed. These adverse effects would be minor and short-term, lasting only the duration of the planning and construction period.

One last element to think of when considering impacts to park operations is the funding for this project. It could be considered this project would make use of funds that could be use elsewhere, therefore causing impact to some other are where these funds could be applied. The total cost for this proposed action would be $400,000 for both of the cabins, as well as $400,000 for the lab expansion. Because much of this funding would come in the form of any combination of grant funds, base funds, donations, and restitution funding from previous disasters, such as oil spills, it is too difficult at this time to determine what would be affected by the use of these funds. Since the park does consider the management of nesting sea turtle species as its number one resource issue, any monies spent for this action would be consistent with the mission of Padre Island National Seashore.

Cumulative Effects: Any project that occurs at the National Seashore has an effect on park operations; therefore, most of the actions listed in the cumulative scenario in the introduction of this chapter would have some degree of effect on employees and park operations. Planning projects such as the development of a fire management plan and planning for improvements to the visitor center typically involve the majority of the National Seashore's staff to contribute their expertise and assistance. Resource management projects such as exotic vegetation management or endangered species management would primarily involve resources staff. Building construction would primarily involve the maintenance staff. Visitor contact, interpretation, and safety activities usually involve rangers and interpretive specialists. Under this alternative, park operations associated with the current and future use of the new sea turtle patrol cabins would be improved to a moderate degree, which would cumulatively have a moderate beneficial impact to park operations when considered with other past, present, and reasonably foreseeable future actions.

Conclusion: Construction of two new sea turtle patrol cabins and expansion of the headquarters incubation facilities under the preferred alternative would have a minor to moderate benefit on employees at the National Seashore because the new cabins and incubation facilities would provide a safer and healthier work environment, as well as provide an improved work place. There would be a direct, adverse effect to park operations from planning and construct the cabins; however, this displacement of park staff would be short-term, lasting only the time necessary for planning and constructing of the cabins. Cumulatively, the improvements associated with this alternative would have a moderate beneficial effect on park operations when considered with other past, present, and reasonably foreseeable future actions.

Floodplains

Intensity Level Definitions

To analyze the impacts on floodplains, all available information on floodplains in the park was compiled from personal observations, consultation with other agencies, approved park documents, and Federal Emergency Management Agency (FEMA) floodplains data.

The methodology used for assessing impacts to floodplains is based on how the project would affect the features for which the structure is significant. The thresholds for this impact assessment are as follows:

Negligible: Impacts could result in a change to floodplains and values or increase flood hazards, but the change would not be of any measurable or perceptible consequence.

Minor: Impacts could result in a change to floodplains, and values or increase flood hazards, but the change would be of little consequence. Operations would have minimal risk and have few mitigation measures.

Moderate: Impacts could result in a change to floodplains, and values or increase flood hazards; the change would be measurable and consequential. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful.

Major: Impacts would result in a noticeable change to floodplains, and values or increase flood hazards; the change would result in a severely adverse or substantially beneficial impact. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

Affected Environment

Padre Island National Seashore is located on a largely undeveloped barrier island in southern Texas, along the Gulf of Mexico. The barrier island is a dynamic system subject to many geologic forces and climatic events. The island was formed by accretion, and is continually being reshaped by the actions of wind, rain, ocean currents, waves, and storm events. The National Seashore's landscape changes from broad, white, fine-sand beaches on the Gulf side, to ridges of fore-island sand dunes, to grassy interior upland flats dotted with smaller dunes, ephemeral ponds, and freshwater wetlands. The Laguna Madre, back-island dunes, and wind tidal flats that merge with the waters of the Laguna Madre define the western portion of the National Seashore.

Fore dunes of the park provide protection from hurricanes and tropical storms for the island's backcountry and the Texas mainland. The dunes are fragile and once impacted, can easily be destroyed through erosion and wind action. A line of dunes forming parallel to the beach vary in height from less than six feet to approximately 50 feet above sea level. This primary dune line extends the entire length of Padre Island National Seashore, broken only in a few places where storm wash over channels have occurred, or road cuts have been constructed.

Executive Order 11988, *Floodplain Management*, requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. According to the Padre Island National Seashore Final Oil and Gas Management Plan/Environmental Impact Statement (PAIS, 2000), and FEMA floodplains maps, most of the park and all of the project area lies within the 100-year floodplain for the Gulf of Mexico and the Laguna Madre. The exception is the higher fore dune areas located along the Gulf beach shoreline. The park is subjected to periodic flooding from tropical storm events, hurricanes, and severe rainfall. The hurricane season begins June 1 and continues through November 30. Storm surge levels can range from 9 to 12 feet above sea level (Weise and White 1980).

The park would provide a draft floodplains statement of findings to the various state and federal agencies required by the NPS's Director's Order and Procedural Manual #77-2: Floodplain Management.

Impacts of Alternative A (No-Action Alternative) on Floodplains

Under Alternative A, No Action, the sea turtle patrol cabins and Headquarters incubation facility expansion would not be built, resulting in no new impacts on floodplains. However, impacts on floodplains in the analysis area would continue as a result of park, commercial, and recreational vehicle use, oil and gas operations, and current park development.

Existing vehicle use, oil and gas operations, and park development would continue to impact floodplains within the analysis area. Since the entire park is located within the 100-year floodplain, with the exception of a few of the fore dunes, there are no practicable alternatives to locating these operations outside the 100-year floodplains. Vehicles associated with recreational use of the park, park operations, and ongoing oil and gas operations may leak fluids that could be transported via surface waters thereby affecting floodplain values.

Existing park development including the Malaquite Visitor Center and the Bird Island Basin, park administrative offices, residences, access roads, and water treatment facility continue to impact floodplains within the analysis area. As nearly the entire park lies within floodplains, no practicable alternative exists for locating these facilities outside of the 100-year floodplain. In the event of a major tropical storm or significant flooding event, existing park facilities and infrastructure could alter surface flow thereby affecting floodplain values. However, given the minimal acreage impacted from current park development and the range of storm surges associated with severe tropical storms, it is not likely that the floodplain values would be appreciably affected.

Existing uses, including park infrastructure, oil and gas operations, and vehicle usage of the park, would result in localized, long-term, negligible, adverse impacts on water resources and floodplains within the analysis area.

Cumulative Effects: Under Alternative A, No Action, cumulative impacts on and floodplains throughout the park would result from the continuing operation of 13 nonfederal oil and gas operations within the park on 358 acres, park development on 400 acres, future drilling and production of up to 16 wells projected in the park's reasonably foreseeable development scenario on up to 241.75 acres (NPS 2001b). As some oil and gas operations are developed in the park, others would be plugged, abandoned, and reclaimed; therefore, impacts would be distributed over time. A recent reduction in the size of the Malaquite Visitors Center parking lot by approximately 2.3 acres occurred in 2008. Other activities that could impact water resources and floodplains park-wide include prescribed fires, future park developments, routine maintenance of park roads, park, commercial and recreational vehicle use, and recreational activities.

Current park development has a long-term disturbance of approximately 400 acres of park habitat within the 100-year floodplains. Existing and future development of oil and gas access roads and pads within the park could result in altering surface water flow and locally increasing soil erosion. Leaks and spills from oil and gas operations could be localized to widespread, with minor to major, impacts on floodplains. Spills from oil and gas operations or tankers in the Laguna Madre or Gulf of Mexico could be transported by water into the park and cause widespread impacts and result in long-term clean-up and remediation.

Cumulative impacts on floodplains throughout the park are expected to be localized near developments, with short to long-term, negligible to minor, adverse impacts; but in the event of a spill from offshore oil and gas operations or tankers, impacts could be widespread, with negligible to moderate, adverse impacts on the park's floodplains, primarily along the park's shorelines.

Conclusion: Under Alternative A, No Action, the two new sea turtle patrol cabins and the Headquarters incubation facility expansion would not be constructed, resulting in no new impacts on floodplains. Existing vehicle use on the Gulf of Mexico beach and access roads, continuing operation of pipelines and wells, and continuing operation and use of park facilities and development would result in localized, long-term, negligible to minor, adverse impacts on floodplains within the analysis area. Cumulative impacts from existing and future oil and gas operations in the park, park developments and operations, and visitor uses are expected to result in short to long-term, negligible to minor, adverse impacts localized near developments throughout the park. However, in the event of a spill from offshore oil and gas operations or tankers, impacts could be long-term and widespread, ranging from negligible to moderate, adverse impacts. No impairment to floodplains would result from implementation of this alternative.

Impacts of Alternative B (Preferred Alternative) on Floodplains

Under Alternative B, Proposed Action, the two new sea turtle patrol cabins would be constructed, resulting in the long-term disturbance of approximately 0.15 acres within the 100-year floodplain. The expansion of the incubation facilities in the headquarters compound would take place on the engineered caliche surface so would not create new impacts to the floodplain. Existing impacts on floodplains within the analysis area would be similar to Alternative A, No Action, with localized, long-term, negligible to

minor, adverse impacts associated with existing park development, vehicle use, and the continued operation of oil and gas pipelines and wells.

There is no practicable alternative to locating the proposed cabins or incubation facilities expansion outside the 100-year floodplain because the entire park, with the exception of the higher dunes, is located within floodplains. Impacts associated with the construction of the new cabins could result in minor changes in surface hydrology due to the presence of structure where one did not exist before. Mitigation measures designed to minimize the risk of erosion would be implemented to reduce the impact on floodplain values stemming from sedimentation. The proposed facility would be elevated to a lowest floor elevation of 11 feet, to mitigate structure investment within the Gulf of Mexico Base Flood Elevation of 9-10 feet (FEMA 1983). Flooding risk associated with the new cabins is reduced given that previously documented storm surges were less than the elevated height of the new cabins. In addition, the minimal impact of 0.15 acres is negligible compared to the 740 acres currently developed in the park. Alternative B, Proposed Action would result in a localized, long-term, negligible, adverse impact on floodplains.

Cumulative Effects: Under Alternative B, Proposed Action, cumulative impacts on floodplains throughout the park would be similar to those described under No Action, with impacts from existing and future oil and gas operations in the park, park developments and operations, and visitor uses, resulting in short to long-term, negligible to minor, adverse impacts localized near developments throughout the park; however, in the event of a spill from offshore oil and gas operations or tankers, impacts could be long-term and widespread, ranging from negligible to moderate, adverse impacts to the park's floodplains.

Conclusion: Under Alternative B, Proposed Action, the two sea turtle patrol cabins and the expansion of the incubation facilities would be constructed, resulting in the long-term occupancy of 100-year floodplains. Constructing the new cabins would result in a localized, long-term, negligible, adverse impact on floodplains. Cumulative impacts from existing and future oil and gas operations in the park, park development and operations, and visitor uses are expected to result in short to long-term, negligible to minor adverse impacts, localized near developments throughout the park; however, in the event of a spill from offshore oil and gas operations or tankers, impacts could be long-term and widespread, ranging from negligible to moderate adverse impacts. No impairment to floodplains would result from implementation of this alternative.

CONSULTATION AND COORDINATION

Internal Scoping

Internal scoping was conducted by an interdisciplinary team of professionals from Padre Island National Seashore. The interdisciplinary team members met at various occasions during 2009 and 2010 to discuss the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures. The team also gathered background information and discussed public outreach for the project. Over the course of the project, team members have conducted individual site visits to view and evaluate the proposed construction sites.

External Scoping

External scoping was conducted to inform the public about the proposal to construct the two new sea turtle patrol cabins at Padre Island National Seashore and to generate input on the preparation of this environmental assessment. This effort was initiated February 20, 2010 with the distribution of a scoping letter, which was bulk-mailed to over 500 people on the National Seashore's mailing list, offering 30 days to comment on the project.

During the scoping period, 20 responses were received from the public through letters, telephone calls, and visitor contact. Nearly all (17) responses were in favor of the proposed project and supportive of the sea turtle recovery program. One response challenged the Kemp's ridley sea turtle recovery plan—a plan created by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service.

Agency Consultation

In accordance with the Endangered Species Act, the National Park Service contacted the U.S. Fish and Wildlife Service with regards to federally listed special status species, and in accordance with National Park Service policy, the National Seashore also contacted the Texas Parks and Wildlife Department with regards to state-listed species. The results of these consultations are described in the *Special Status Species* section in the *Purpose and Need* chapter.

In accordance of Section 10 of the Rivers and Harbor Act and Section 404 of the Clean Water Act the National Park Service contacted the U.S. Army Corps of Engineers in regards to jurisdictional wetlands. The results of this consultation are described in the *Wetlands* section in the *Environmental Consequences* chapter.

In accordance with Section 106 of the National Historic Preservation Act, the National Park Service provided the State Historic Preservation Officer at the Texas Historic Commission an opportunity to comment on the effects of this project. The results of this consultation are described in the *Archeological Resources* section in the *Environmental Consequences* chapter.

Native American Consultation

The Tonkawa Tribe of Oklahoma is the only known Native American tribe that has potential lineage to the Native Americans that once inhabited Padre Island. They were contacted at the beginning of this project to determine if they had any concern over ethnographic resources in the project area, and asked if they wanted to be involved in the environmental compliance process. There were no objections received from the Tonkawa Tribe to the proposed project.

Environmental Assessment Review and List of Recipients

The environmental assessment will be released for public review in September 2010. To inform the public of the availability of the environmental assessment, the National Park Service will publish and distribute a letter or press release to various agencies, tribes, and members of the public on the park's mailing list, as well as place an ad in the local newspaper. Copies of the environmental assessment will be provided to interested individuals, upon request. Copies of the document will also be available for review at the National Seashore's visitor center and on the internet at http://parkplanning.nps.gov/pais.

The environmental assessment is subject to a 30-day public comment period. During this time, the public is encouraged to submit their written comments to the National Park Service address provided at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The National Park Service will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the environmental assessment, as needed.

Interdisciplinary Team

From the National Park Service, Padre Island National Seashore, Texas:

- Joe Escoto, Superintendent
- Donna Shaver, Chief, Division of Sea Turtle Science and Recovery
- Jim Lindsay, Chief, Division of Science and Resources Management
- Deanna Mladucky, Chief, Division of Visitor and Resource Protection
- Larry Turk, Chief, Division of Facilities Management
- Cynthia Rubio, Biologist, Division of Sea Turtle Science and Recovery
- Jennifer Shelby-Walker, Biologist, Division of Sea Turtle Science and Recovery
- Shauna Ertolacci, Biologist, Division of Sea Turtle Science and Recovery
- Travis Clapp, GIS Technician, Division of Science and Resources Management
- Wade Stablein, NEPA/106 Specialist, Division of Science and Resources Management

From the National Park Service, Intermountain Regional Office, Denver, CO:

- Chris Turk, Regional Environmental Quality Coordinator
- Laurie Domler, Regional NEPA/106 Specialist
- Cheryl Eckhardt, Regional NEPA/106 Specialist
- Jacquelin St. Clair, Archeologist
- Michael Martin, Hydrologist (Floodplain Specialist)
- Kevin Noon, Natural Resource (Wetland) Specialist

List of Preparers

From the National Park Service, Padre Island National Seashore, Corpus Christi, Texas:

- Wade Stablein, Project Lead, Writer, NEPA , NHPA, Biology
- Travis Clapp, GIS, Maps
- Jim Lindsay, Geology, Paleontology, Project Review

REFERENCES

NPS 2000	Oil and Gas Management Plan Padre Island National Seashore, Texas.
NPS 2006	*Management Policies*, National Park Service, U.S. Department of the Interior, December 2006.
NPS 2004a	Natural Resource Management Reference Manual #77, Procedural Manual 77-1: Wetland Protection.
NPS 2004b	Natural Resource Management Reference Manual #77, Procedural Manual 77-2: Floodplain Management
NPS 1983	General Management Plan and Development Concept Plan, Padre Island National Seashore, 1983.
FWS 2010	Concurrence from FWS on T&E.
THC 2010	Texas Historical Commission (State Historic Preservation Officer), letter affirming a determination of ―no historic properties affected‖ for the project, dated May 27, 2010.
TPWD 2010	Concurrence from TPWD on T&E.
NPS 2010	NPS Stats, National Park Service Public Use Statistics Office. http://www.nature.nps.gov/stats/park.cfm. Accessed May 4, 2010.
Limpus 1979	Limpus, C.J., Baker, V., and J. D. Miller Movement Induced Mortality of Loggerhead Eggs
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Morton 1994	Morton R. A., Texas Barriers; Geology of Holocene Barrier Island Systems 75-114.

APPENDIX A - IMPAIRMENT

National Park Service's *Management Policies, 2006* require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values.

However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within park, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of these resources or values. An impact to any park resource or value may, but does not necessarily, constitute an impairment, but an impact would be more likely to constitute an impairment when there is a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to pursue or restore the integrity of park resources or values and it cannot be further mitigated.

The park resources and values that are subject to the no-impairment standard include:

- the park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
- any additional attributes encompassed by the specific values and purposes for which the park was established.

Impairment findings are not necessary for visitor use and experience, socioeconomics, public health and safety, environmental justice, land use, and park operations, because impairment findings related back to park resources and values, and these impact areas are not generally considered park resources or values

according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. The NPS's threshold for considering whether there could be impairment is based on whether an action would have major (or significant) effects. The following analysis evaluates whether or not the applicable resources carried forward in this document would be impaired by the preferred alternative.

APPENDIX B - STATE AND FEDERALLY-LISTED SPECIES FOR PADRE ISLAND NATIONAL SEASHORE

Federally Listed Endangered and Threatened Species

Gulf Coast Jaguarundi	(E)	Herpailurus yagouaroundi cacomitli
Ocelot	(E)	Leopardus pardalis
West Indian manatee (=Florida)	(E)	Trichechus manatus
Coues' rice rat	(C)	Oryzomys couesi aquaticus
Green sea turtle	(T)	Chelonia mydas
Loggerhead sea turtle	(T)	Caretta caretta
Hawksbill sea turtle	(E w/CH‡)	Eretmochelys imbricata
Kemp's Ridley sea turtle	(E)	Lepidochelys kempii
Leatherback sea turtle	(E w/CH‡)	Dermochelys coriacea
Black-spotted newt	(SOC)	Notophthalmus meridionalis
Rio Grande lesser siren	(SOC)	Siren intermedia texana
Texas horned lizard	(SOC)	Phrynosoma cornutum
American alligator	(TSA)	Alligator mississipiensis
Whooping crane	(E w/CH)	Grus americana
Bald eagle	(T)	Haliaeetus leucocephalus
Piping plover	(T w/CH)	Charadrius melodus
White-faced Ibis	(SOC)	Plegadis chihi
Brown Pelican	(E)	Pelecanus occidentalis
Northern Aplomado Falcon	(E)	Falco femoralis septentrionalis
Audubon's Oriole	(SOC)	Icterus graduacauda audubonii
Cerulean Warbler	(SOC)	Dendroica cerulea
Reddish Egret	(SOC)	Egretta rufescens
Sennett's Hooded Oriole	(SOC)	Icterus cucullatus sennetti
Texas Botteri's Sparrow	(SOC)	Aimophila botterii texana
Texas Olive Sparrow	(SOC)	Arremonops rufivirgatus rufivirgatus
Tropical Parula	(SOC)	Parula pitiayumi nigrilora
Mountain Plover	(P/T)	Charadrius montanus
Brownsville Common Yellowthroat	(SOC)	Geothlypis trichas insperata
Bailey's ballmoss	(SOC)	Tillandsia baileyi
Roughseed sea-purslane	(SOC)	Sesuvium trianthemoides
South Texas ambrosia	(E)	Ambrosia cheiranthifolia
Black lace cactus	(E)	Echinocereus reichenbachii var. albertii
Slender rush-pea	(E)	Hoffmannseggia tenella
Welder machaeranthera	(SOC)	Psilactis heterocarpa
Texas Ayenia	(E)	Ayenia limitaris
Lilia de los llanos	(SOC)	Echeandia chandleri
Los Olmos tiger beetle	(SOC)	Cicindela nevadica olmosa
Maculated manfreda skipper	(SOC)	Stalligsia maculosus

State Listed Threatened and Endangered Species

Texas horned lizard	(T)	Phrynosoma cornutum
Indigo snake	(T)	Drymobius corias

Scarlet snake	(T)	Cemophora coccinea
Sheep frog	(T)	Hypopachus variolosus
South Texas siren (large form)	(T)	Siren sp. 1
Loggerhead sea turtle	(T)	Caretta caretta
Green sea turtle	(T)	Chelonia mydas
Atlantic hawksbill sea turtle	(E)	Eretmochelys imbricata
Kemp's ridley sea turtle	(E)	Lepidochelys kempi
Leatherback sea turtle	(E)	Dermochelys coriacea
Bald Eagle	(T)	Haliaeetus leucocephalus
Northern Aplomado Falcon	(E)	Falco femoralis septentrionalis
Southwestern Willow Flycatcher	(E)	Empidonax trailii extimus
Eastern Brown Pelican	(E)	Pelecanus occidentalis
Piping Plover	(T)	Charadrius melodus
Reddish Egret	(T)	Egretta rufescens
White-Faced Ibis	(T)	Plegadis chihi
Wood Stork	(T)	Mycteria Americana
Swallow-Tailed Kite	(T)	Elannoides forticatus
White-Tailed Hawk	(T)	Buteo albonotatus
American Peregrine Falcon	(E)	Falco peregrinus anatum
Black-Capped Vireo	(E)	Vireo atricapillus
Tropical Parula	(E)	Parula ptiayumi nigrilora

Fishes
No listed species documented at this time within Padre Island National Seashore.

Marine Mammals
All marine mammals, excluding the West Indian Manatee, only occur in the Padre Island National Seashore when stranded due to illness or death.

Index
Statewide or area-wide migrants are not included, except where they breed or occur in concentrations. The whooping crane is an exception; an attempt is made to include all confirmed sightings on this list.

E = Species in danger of extinction throughout all or a significant portion of its range.
T = Species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
C = Species for which the Service has on file enough substantial information to warrant listing as threatened or endangered.
CH = Critical Habitat (in Texas unless annotated ‡)
P/E = Species proposed to be listed as endangered.
P/T = Species proposed to be listed as threatened.
TSA = Threatened due to similarity of appearance.
SOC = Species for which there is some information showing evidence of vulnerability, but not enough data to support listing at this time.
‡ = CH designated (or proposed) outside Texas
~ = Protection restricted to populations found in the "interior" of the United States. In Texas, the least tern receives full protection, except within 50 miles (80 km) of the Gulf Coast.

APPENDIX G-2:

FINDING OF NO SIGNIFICANT IMPACT
For the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project

Overview and Background

The Department of the Interior (DOI), National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA), and United States Department of Agriculture (USDA), (collectively "Federal Trustees") have conducted an environmental assessment (EA) for the construction of over four miles of breakwaters, five acres of intertidal reef habitat and 267 acres of subtidal reef habitat at four locations across the Mississippi Gulf Coast. The Restoring Living Shorelines and Reefs in Mississippi Estuaries Project will be implemented by the Mississippi Department of Environmental Quality. The project is an early restoration project to be funded as part of the *Deepwater Horizon* Natural Resource Damage Assessment and Restoration process in accordance with the "Framework for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill." This project is one of several projects to be implemented by the Trustees as identified in the Final Phase IV Early Restoration Plan and Environmental Assessments (Final Phase IV ERP/EA) to accelerate restoration, and represents an initial step toward the restoration of natural resources injured by the *Deepwater Horizon* oil spill.

Under the Oil Pollution Act of 1990, damages recovered from parties responsible for natural resource injuries are used to restore, replace, rehabilitate and/or acquire the equivalent of the injured natural resources and services they provide (33 U.S.C. § 2706). When Federal Trustees are involved, these restoration activities are subject to the requirements of the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 et seq. Therefore, the Federal Trustees prepared this EA to evaluate the potential environmental impacts associated with the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project. This EA tiers from the Final Phase III Early Restoration Plan and Programmatic Environmental Impact Statement (Final Phase III ERP/PEIS) prepared by the Trustees in 2014 and is prepared in accordance with NEPA, Council on Environmental Quality (CEQ) NEPA regulations, and all applicable agency NEPA regulations and guidance.

Summary of Proposed Action and Alternatives

The CEQ NEPA regulations require the decision maker to consider the environmental effects of the proposed action and a reasonable range of alternatives, including the No Action Alternative, (40 CFR § 1502.14). The EA addresses the Proposed Action and a No Action alternative. The purpose of the proposed action is to restore secondary productivity through the placement of intertidal and subtidal reefs and the use of living shoreline techniques including breakwaters. Over time, the breakwaters, intertidal and subtidal restoration areas would develop into living reefs that support benthic secondary

productivity including but not limited to oysters/bivalves mollusks, annelid worms, shrimp, and crabs. Breakwaters would reduce shoreline erosion as well as marsh loss.

Under the proposed action, the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project would be implemented at selected locations in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay in Jackson, Harrison, and Hancock Counties, Mississippi and would consist of the overall construction of over four miles of breakwaters, five acres of intertidal reef habitat and 267 acres of subtidal reef habitat. The Proposed Action is being selected because it will result in more efficient recovery of injured salt marsh and lost benthic secondary productivity compared to the No Action Alternative. Under the No Action Alternative, the Trustees would not receive funding to restore secondary productivity through the placement of intertidal and subtidal reefs and the use of living shoreline techniques and the Trustees would not pursue Restoring Living Shorelines and Reefs in Mississippi Estuaries as part of Phase IV Early Restoration. The Federal Trustees prepared the Final EA and this Finding of No Significant Impact after considering input from the public during the public comment period for the Draft Phase IV ERP/ EA.

Analysis Summary

The Federal Trustees evaluated potential environmental effects of the proposed action and analyzed the significance of this action based on NEPA, CEQ NEPA regulations, and all applicable agency NEPA regulations and guidance. CEQ regulations (40 CFR §1508.27) state that the significance of an action should be analyzed both in terms of "context" and "intensity." Analysis discussed and summarized below is relevant to making a finding of no significant impact. See Phase IV ERP/EA Chapter 6, sections 6.2.5, 6.2.7, 6.2.8, and 6.2.9 (overall summary). When environmental consequences were reviewed across the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project, the analysis suggests that there will be long-term minor to moderate adverse impacts to geology and substrates, and there will be minor short-term adverse impacts to other project specific resource categories. The project will provide long-term benefits by creating approximately 267 acres subtidal reef habitat, five acres of intertidal reef habitat, and approximately four miles (17.9 acres) of reef, as discussed below and in the Phase IV ERP/EA Chapter 6:

- Impacts to the physical environment (geology and substrates, hydrology and water quality) were assessed in Phase IV ERP/EA Chapter 6, sections 6.2.7.1.1 and 6.2.7.1.2.
    - Geology and substrates: Placement of structures such as breakwaters, intertidal and subtidal reefs will permanently cover existing geology and substrates. The adverse effects will be minor to moderate and long-term, because they will affect substrate/geologic characteristics of the project footprint, and could extend beyond the construction period. There will be long term, minor to moderate impacts to 289.9 acres of soft bottom and hard bottom habitat due to the construction of breakwaters (17.9 acres), subtidal reefs (267 acres) and intertidal reefs (5 acres). There will be short term, minor impacts to 85.4 acres of soft bottom habitat for the construction of temporary flotation channels (if needed for construction of breakwaters) and subtidal and intertidal reef habitat. The impacts resulting from the temporary flotation channels will

be short-term because the channels will be backfilled as part of the construction process. The project will result in long-term benefit resulting from the development of 289.9 acres of substrate (breakwater materials and cultch) into living reefs that support benthic secondary productivity. There will be long-term benefits to shorelines and marsh resulting from the placement of 21,912 linear feet of breakwater along eroding shorelines. Breakwaters will reduce the wave energy, thereby slowing shoreline and marsh erosion and resulting in the long-term protection of the shoreline. Therefore, the project will have a long-term beneficial impact on geology and substrate.

- Hydrology, tides and currents

    - Breakwater construction: Shoreline protection and erosion reduction could generally help reduce storm surges on shorelines and marshes. Breakwater construction could reduce the loss of the wetlands and channel networks particularly in St. Louis Bay. Gaps will be present between breakwater segments that will allow tidal exchange flows and waterway access. Breakwaters will change natural current patterns, sediment accretion and erosion rates. Wave energy and resulting erosion will be reduced. This could be a long-term beneficial effect to shorelines that will extend beyond the construction period.

    - Intertidal and subtidal reef habitat: Creating intertidal and subtidal reef habitat could help protect eroding wetlands and shallow water areas. Placement of cultch and other materials to establish living reefs adjacent to shorelines and breakwaters will reduce wave energy reaching shorelines. This will provide long-term beneficial effects by reducing wave energy of storm surges as well.

- Water quality: Placement of the breakwaters, subtidal and intertidal reef will result in short-term, minor adverse impacts to water quality as a result of resuspension of sediment by vessels (barges, tugs, skiffs, etc.) moving in and out of the project area, excavation of the temporary flotation channels, placement of breakwaters and deployment of intertidal and subtidal reefs. The suspended sediment may be transported into surrounding wetlands and waterways. However, the area is currently exposed to elevated turbidity levels as a result of resuspension of sediment from river transport and during frequent storms, tides, and other typical weather events. Impacts from turbidity will be minor, short-term and limited in spatial extent.

    - In addition to turbidity, the water quality could be adversely impacted by leaks or spills of fuel and lubricants used by vessels and other equipment during the construction of the temporary flotation channels, breakwater, and reefs. Impacts, if any, will be short-term, localized and minor.

    - Breakwaters, once established as living reefs, could benefit local water clarity because bi-valves such as oysters and mussels feed by filtering the water column. The reef could also reduce wave energy reaching the shoreline, minimizing erosion, and decreasing sediment suspended in the water column

from erosion. Long-term this method could result in minor improvements to water quality. The benefits will be long-term because they will extend beyond the construction period.

- Floodplains: The majority of the project is located below the mean high water level and will not impact the floodplain in the project area. Shoreline protection and erosion reduction could generally help reduce storm surges on coastal wetlands, and limit the shoreward extent of saltwater flow.

- Wetlands: There will be short-term, minor, and localized indirect adverse impacts from sediment movement that could temporarily impact the shoreline edge near the project components. The project will result in long-term beneficial impacts to salt marsh by reducing shoreline erosion and resulting marsh degradation. These actions could reduce the pace and extent of future saltwater intrusion to freshwater and brackish systems and reduce erosion and loss of the wetlands and channel networks.

- Impacts to the biological environment were assessed in Phase IV ERP/EA Chapter 6, sections 6.2.7.2.1:

  - Submerged aquatic vegetation (SAV): No long-term adverse effects to SAVs are expected. Short-term, minor, adverse impacts to SAVs could occur in the vicinity of the project resulting from temporary sedimentation in beds. Any disturbance will be temporary in nature; it is anticipated that SAV beds will recover naturally. Construction of the breakwaters in St. Louis Bay and Back Bay could provide or protect areas conducive to SAV growth which could provide long term benefits as established or ephemeral SAV beds in these water bodies.

  - Invasive species: No long-term adverse effects from invasive species are expected. Any adverse impacts from invasive species are expected to be short-term and minor. Mitigation measures and best management practices (BMPs) will reduce the likelihood of impacts from invasive species.

  - Benthic infauna and epifauna: Potential short-term minor impacts to benthic organisms may occur from increased turbidity, substrate disturbance, or siltation during construction. Following construction, there is expected to be increased habitat utilization of the zone between the breakwater and the existing eroded shoreline, and long-term benefit due to the placement of hardened structure. This represents a long-term benefit for these organisms.

  - Protected species: The Trustees are coordinating with the U.S. Fish and Wildlife Service (USFWS) and NOAA National Marine Fisheries Service (NMFS) to determine affects to protected species. A summary of impacts to protected species and critical habitats is provided below:

- Marine mammals: Short-term minor adverse effects due to noise and turbidity associated with placement of structures could temporarily disturb marine mammal species if they are in the vicinity of the project area. Based on the mobility of these species, the short duration of construction activities, the selected construction methodology, and implementation of BMPs, effects on marine mammals are not anticipated.

- Sea turtles: Loggerhead (threatened), Green (threatened), Kemp's ridley (endangered), Leatherback (endangered), Hawksbill (endangered): Applicable to all project components. While not likely to be impacted, sea turtles are a mobile marine species and project activities will not impede transit routes. There is no nesting habitat in the project area. There is no designated or proposed critical habitat for sea turtles within the action area. If individuals enter construction areas, construction will be halted. Accordingly, the Trustees have made a "Not Likely to Adversely Affect" determination under the ESA for the five species of sea turtles, and coordination with NOAA Nation Marine Fisheries Service is ongoing.

- Piping plover and red knot (both threatened) and piping plover Critical Habitat: Applicable to all project components. Piping plover Critical habitat applicable to Grand Bay Intertidal and Subtidal Reefs. Piping plover could be present between August and May. The red knot could be present from March to April and September to October. If individuals of either species are within 150 feet of the construction area, work will stop until the individual(s) leave of their own volition. The project will be implemented so as to ensure no effects to the PCEs of nearby piping plover critical habitat in the Grand Bay area are impacted. Accordingly, the Trustees have made a "Not Likely to Adversely Affect" determination under the ESA for piping plover and red knot, and a "No destruction or adverse modification" determination for piping plover designated critical habitat, occurring near Grand Bay Intertidal and Subtidal Reefs. In August 2015, the Trustees requested concurrence from the U.S. Fish and Wildlife Service (USFWS) regarding these determinations (DOI 2015). The USFWS provided concurrence with this determination on August 24, 2015 (USFWS 2015).

- West Indian manatee (endangered): Applicable to all project components. West Indian manatees are not likely to occur in the project area. Short-term minor impacts could occur if manatees come into contact with construction activities. Manatees are a mobile marine species and project activities will not impede transitory routes. If individuals are within 50 feet of construction areas, construction will be halted until the individual leaves the area of its own volition. Standard Manatee Conditions for In-Water Work (USFWS 2011) will be followed. Accordingly, the Trustees have made a "Not Likely to Adversely Affect" determination under the ESA for the West Indian manatee. In August

2015, the Trustees requested concurrence from the USFWS regarding this determination (DOI 2015). The USFWS provided concurrence with this determination on August 24, 2015 (USFWS 2015).

- Gulf sturgeon (threatened) and Critical Habitat: Applicable to Grand Bay Intertidal and Subtidal Reefs; and Deer Island Subtidal Reef. The project is in designated critical habitat. The Trustees have made a "Not Likely to Adversely Affect" determination under the ESA for Gulf sturgeon, and a "No destruction or adverse modification" determination for Gulf sturgeon designated critical habitat. Coordination with NOAA Nation Marine Fisheries Service is ongoing. To the extent practicable, project construction at the Deer Island Subtidal Reef and the Grand Bay Intertidal and Subtidal Reef project components will be limited to the window between May and October, after sturgeon have migrated to their riverine habitat. No project components are located within riverine ecosystems. If work continues beyond the May to October window, continued adherence to the Sea turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) will minimize the potential for impacting Gulf Sturgeon. If individuals enter construction areas, short-term, minor impacts could be the result.

- Migratory Birds/Bald and Golden Eagles (protected under MBTA and BGEPA): Golden eagles are not present in the area. Potential adverse effects to migratory birds include elevated noise levels due to the presence of construction equipment. These species are mobile and will likely exit the area during construction. Due to the implementation of best management practices no "take" is anticipated for bald eagles and migratory birds. Coordination under the MBTA and BGEPA has been completed (DOI 2015).

- Alabama red-belly turtle (endangered): Applicable to all projects in Back Bay and vicinity. Due to the lack of SAVs for foraging at the project site it is unlikely that the species will be present in the project area, therefore no impacts are expected to occur to the Alabama red-belly turtle. Accordingly, the Trustees have made a "No Effect" determination under the ESA and in August 2015, requested concurrence from the USFWS regarding this determination (DOI 2015). The USFWS provided concurrence with this determination on August 24, 2015 (USFWS 2015).

- Mississippi diamondback terrapin: This is a state listed species, ranked by the Mississippi Department of Wildlife Fisheries and Parks as S2: Imperiled in Mississippi. Applicable to all project components, which could contain nesting habitat. In order to avoid impacting the diamondback terrapin and habitat, the Trustee will identify and also avoid pocket beaches to the maximum extent practicable in the design of the project. Since work will be conducted in the shallow water marine environment, impacts to diamondback terrapin and habitat are not anticipated.

- Essential Fish Habitat (EFH):
    - It is anticipated that finfish will move away to other readily available aquatic habitats during the construction period. Fish present in the area of the project component could be subject to a temporary increase in sound pressure levels, a temporary decrease in water quality, entrainment in dredge sediments, and removal of benthos from areas. Sound pressure level increases or entrainment could result in mortality of individual finfish. Overall, this will be a minor short-term adverse effect that will not be expected to reduce local fish populations or designated EFH.
    - There will be minor, long-term, adverse impacts to EFH for species that rely on soft bottom habitat as a result of the project.
    - There will be short term, minor, impacts to EFH for species that utilize both soft and hard bottom habitat.
    - There will be a long term benefit to EFH by creation of reef habitat.

- Impacts to human uses and socioeconomics were analyzed in Phase IV ERP/EA Chapter 6 sections 6.2.7.3.1; 6.2.7.3.2; 6.2.7.3.3, and 6.2.7.3.4:
    - Land and Marine Management: Implementation of the project will be consistent with planned land and marine management and will not disrupt existing or planned land uses. There could be short-term minor adverse impacts due to deployment of subtidal and intertidal reefs. There will be long term ecological benefits that will be consistent with planned land and marine management.
    - Aesthetics and Visual Resources: During construction, there will be short-term, minor adverse aesthetic and visual impacts for recreational boaters and fishermen due to construction equipment in and around the project area. Residents, people who use the bays and estuaries for recreation, and businesses along the shoreline may experience minor adverse aesthetic and visual impacts during construction. The deployed materials will not adversely affect aesthetic and visual resources.
    - Public Health and Safety and Shoreline Protection: There could be minor short-term adverse impacts resulting from the operation of heavy equipment or from the incidental releases of surface water contaminates from barge and boats. The selected breakwater structures will have long-term benefits by helping to protect the shoreline from wave erosion.

- Because the proposed project has reasonably foreseeable effects on coastal uses or resources that are the subject of federally approved Coastal Zone Management Plans in Mississippi, the Federal Trustees submitted a consistency determination for the project to the Mississippi

Department of Marine Resources (MDMR). MDMR concurred with that determination on behalf of its state. As noted in that response, additional consistency review may be required pursuant to federal regulations (see 15 C.F.R. Part 930) prior to project implementation.

- No significant adverse cumulative effects are anticipated from implementation of this project. The Restoring Living Shorelines and Reefs in Mississippi Estuaries Project will occur across the Mississippi Gulf Coast, at eight sites in four bays, and construction is likely to occur at different times. This project will not contribute adverse cumulative impacts when added to past, present or reasonably foreseeable future actions.

- The proposed action is not expected to result in the introduction or spread of any invasive species.

Copies of the draft EA for this project were available to the public as provided in a Federal Register notice published on May 20, 2015. See *Deepwater Horizon* Oil Spill, Draft Phase IV Early Restoration Plan and Environmental Assessments; 80 FR 29019-29021 (May 20, 2015). Public comments on the Draft Phase IV ERP/EA were taken during a 47-day public comment period extending from May 20, 2015 to July 6, 2015 (80 FR 35393, June 19, 2015). Public comments received during this period have been considered and addressed by the Trustees in the Final Phase IV ERP/EA (Chapter 15, Response to Public Comments). The Final Phase IV ERP/EA is hereby incorporated by reference.

Agency Coordination and Consultation Summary

A summary of the results from each coordination and consultation process is provided below:

- Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA): NOAA reviewed the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project for compliance with the MSFCMA. It was determined that some activities have the potential for short and long-term minor site-specific adverse impacts to water bottom and water column characterized as EFH, however, NMFS concurred that the BMPs proposed for implementation would be sufficient to avoid, minimize or offset impacts and no additional conservation recommendations were required.

- Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (GEPA), and Marine Mammal Protection Act (MMPA): To fulfill requirements and obligations under ESA and MMPA, NOAA is reviewing and DOI completed a review of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project for compliance with Section 7 of the ESA of 1973 , as amended (16 U.S.C. 1531 et seq.) and Section 101 of the MMPA of 1972, as amended (16 U.S.C. 1371(a)(5) et seq.). Biological Evaluation forms were submitted to the USFWS for consultation and coordination on the ESA, MBTA, and BGEPA (DOI 2015) and to NMFS for ESA (NOAA 2015). The USFWS local field office concurred by letter dated August 24, 2015. See Phase IV ERP/EA Chapter 6, sections 6.2.7.2.1. The Trustees are awaiting NMFS SERO's response on ESA. The Trustees coordinated with NMFS SERO's Protected Resources Division to determine that this project does not require authorization under the MMPA.

Impacts to cultural and historical resources protected under Section 106 of the National Historic Preservation Act (NHPA) were evaluated in the Final Phase IV ERP/EA Chapter 6. The formal compliance review for this project including NHPA section 106 and Tribal consultations has been initiated and will be completed prior to project implementation.

If any further need arises to coordinate and consult with other regulatory authorities, including for example Clean Water Act Section 404 or the Rivers and Harbors Act, the additional coordination or consultation requirements will be addressed prior to project implementation. The status of Federal regulatory permits/approvals will be maintained online (http://www.gulfspillrestoration.noaa.gov/environmental-compliance/) and updated as regulatory compliance information changes. The Federal Trustees' Finding of No Significant Impact for this project is issued subject to the completion of all outstanding compliance reviews under other Federal laws. If the proposed action changes or information is brought to light as a result of completing such reviews that is potentially relevant to the environmental evaluation supporting this finding of no significant impact, that evaluation will be updated or supplemented as required by NEPA and a new determination made by the Federal Trustees under NEPA as to whether the proposed action is likely to significantly affect the quality of the human environment.

Determination

In view of the information presented in this document and the environmental analysis contained in the supporting Phase IV ERP/EA for the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project, the Federal Trustees have determined that project will not significantly impact the quality of the human environment. Accordingly, preparation of an environmental impact statement for this action is not necessary.

FINDING OF NO SIGNIFICANT IMPACT

For the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project

Date: 9/8/2015

Signature: _____

David Westerholm
Director, Office of Response and Restoration
National Ocean Service, NOAA

FINDING OF NO SIGNIFICANT IMPACT

For the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project

Date: 9/4/2015

Signature: _____

Frederick C. Sutter III
Director, Office of Habitat Conservation
National Marine Fisheries Service, NOAA