AUGUST 2019

ALABAMA TRUSTEE IMPLEMENTATION GROUP

DEEPWATER HORIZON OIL SPILL

Draft Restoration Plan III and Environmental Assessment:

Provide and Enhance Recreational Use Opportunities and Birds

EXECUTIVE SUMMARY

On or about April 20, 2010, the *Deepwater Horizon* (DWH) mobile drilling unit exploded, caught fire, and eventually sank in the Gulf of Mexico, resulting in a massive release of oil and other substances from BP Exploration and Production, Inc. (now known as BPplc) Macondo well and causing loss of life and extensive natural resource injuries. Initial efforts to cap the well following the explosion were unsuccessful, and, for 87 days after the explosion, the well continuously and uncontrollably discharged oil and natural gas into the northern Gulf of Mexico. Approximately 3.19 million barrels (134 million gallons) of oil were released into the ocean (*U.S. v. BP et al.*, 2015). Oil spread from the deep ocean to the surface and nearshore environment from Texas to Florida. The oil came into contact with and injured natural resources as diverse as deep-sea coral, fish and shellfish, productive wetland habitats, sandy beaches, birds, sea turtles, and other protected marine life. The DWH oil spill prevented people from fishing, going to the beach, and enjoying typical recreational activities along the Gulf of Mexico. Extensive response actions, including cleanup activities and actions to try to prevent the oil from reaching sensitive resources, were undertaken to try to reduce harm to people and the environment. However, many of these response actions had collateral impacts on the environment and on natural resource services. The oil and other substances released from the well, in combination with the extensive response actions, together make up the DWH oil spill.

The DWH oil spill was subject to the provisions of the Oil Pollution Act (OPA) of 1990, which addresses preventing, responding to, and paying for oil pollution incidents in navigable waters, adjoining shorelines, and the exclusive economic zone of the United States. Under the authority of OPA, a council of federal and state "Trustees" was established on behalf of the public to assess natural resource injuries resulting from the incident and to work to make the environment and public whole for those injuries. As required under OPA, the Trustees conducted a natural resource damage assessment (NRDA) and prepared the Final Programmatic Damage Assessment and Restoration Plan/Programmatic Environmental Impact Statement (Final PDARP/PEIS).

The primary goal of OPA is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving an oil discharge (or substantial threat of an oil discharge). Under OPA, the natural resource injuries for which responsible parties are liable include injuries resulting from the oil discharge and those resulting from response actions or substantial threat of a discharge. OPA specifies that Trustees responsible for representing the public's interest (in this case, state and federal agencies) must be designated to act on behalf of the public to assess the injuries and to address those injuries. The DWH Oil Spill Natural Resource Damage Assessment Trustees for the affected natural resources (DWH Trustees) conducted an NRDA to:

- Assess the impacts of the DWH oil spill on natural resources in the Gulf of Mexico and the services those resources provide.
- Determine the type and amount of restoration needed to compensate the public for these impacts.

Following the assessment, the DWH Trustees determined that the injuries caused by the DWH oil spill affected such a wide array of linked resources over such an enormous area that the effects of the spill must be described as constituting an ecosystem-level injury. Consequently, the DWH Trustees' chosen alternative for restoration planning employs a comprehensive, integrated ecosystem approach to address these ecosystem-level injuries.

In the Final PDARP/PEIS, the DWH Trustees adopted a portfolio of Restoration Types that addresses the diverse suite of injuries that occurred at both regional and local scales. The DWH Trustees identified the need for a comprehensive restoration plan at a programmatic level to guide and direct the ecosystem level restoration effort, based on the following five restoration goals:

- Restore and conserve habitat.
- Restore water quality.
- Replenish and protect living coastal and marine resources.
- Provide and enhance recreational opportunities.
- Provide for monitoring, adaptive management, and administrative oversight to support restoration implementation.

These five goals work both independently and together to restore injured resources and services.

The Final PDARP/PEIS included the funding allocations for each restoration goal. In the 2016 Consent Decree resolving the DWH Trustees' claims against BP for natural resource injuries under OPA, BP agreed to pay up to $8.1 billion in natural resource damages (which includes the $1 billion that BP previously committed to pay for Early Restoration projects) over a 15-year period.

Draft Restoration Plan III and Environmental Assessment

The Alabama Trustee Implementation Group (AL TIG) prepared this document, the Alabama Trustee Implementation Group Draft Restoration Plan III and Environmental Assessment: Provide and Enhance Recreational Opportunities and Birds (Draft RP III/EA) pursuant to OPA and the National Environmental Policy Act (NEPA). The content and findings included in this document are consistent with the DWH Trustees' findings in the Final PDARP/PEIS, from which it tiers. The AL TIG includes two state trustee agencies and four federal trustee agencies: the Alabama Department of Conservation and Natural Resources (ADCNR); the Geological Survey of Alabama; the United States Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA); the United States Department of the Interior (USDOI), represented by the United States Fish and Wildlife Service (USFWS), Bureau of Land Management, and National Park Service; the United States Department of Agriculture (USDA); and the United States Environmental Protection Agency (USEPA) (collectively the AL TIG). For this restoration plan, USDOI serves as the lead federal agency for NEPA compliance.

The AL TIG prepared this Draft RP III/EA to (1) inform the public about DWH NRDA restoration planning efforts, (2) present analysis on the potential restoration benefits and environmental consequences of the alternatives, and (3) seek public comment on the alternatives presented in Table ES-1. In identifying proposed projects/alternatives[1] for this Draft RP III/EA, the AL TIG considered (1) the OPA regulations screening criteria found at 15 Code of Federal Regulations (CFR) 990.54, (2) the Restoration Goals and other criteria identified by the DWH Trustees in the Final PDARP/PEIS, (3) goals developed by the AL TIG for this restoration plan, (4) input from the public, and (5) the current and future availability of funds under the DWH oil spill NRDA settlement payment schedule. Table ES-1 shows the range of alternatives, noting those that are considered preferred in this Draft RP III/EA.

[1] For the purposes of this Draft RP III/EA, each proposed project is considered a separate alternative; therefore, the terms "project" and "alternative" are used interchangeably.

Table ES-1: Reasonable Range of Alternatives and Associated Cost

Alternative	Preferred Y/N	Project Costs
Restoration Type—Provide and Enhance Recreational Opportunities		
No Action	N	$0
Perdido River Land Acquisition (Molpus Tract)	Y	$4,742,540
Bayfront Park Restoration and Improvement Phases IIa and IIb	Y	$4,683,304
Bayfront Park Restoration and Improvement Phase IIa	N	$3,631,679
Gulf State Park Pier Renovation	Y	$2,447,021
Perdido Beach Public Access Coastal Protection	Y*	$333,300
Bon Secour National Wildlife Refuge Recreation Enhancement—Mobile Street Boardwalk	Y*	$1,189,899
Bon Secour National Wildlife Refuge Recreation Enhancement—Centennial Trail Boardwalk	N	$1,711,771
Restoration Type—Birds		
No Action	N	$0
Stewardship of Coastal Alabama Beach Nesting Bird Habitat	Y	$2,018,047
Stewardship of Coastal Alabama Beach Nesting Bird Habitat—Stewardship and Monitoring Only	N	$1,895,597
Dauphin Island West End Acquisition	Y	$6,681,250
Total Funding for Preferred Alternatives		**$22,095,361**

* The Trustees are not proposing to exceed the allocation for Provide and Enhance Recreational Opportunities in this RP III/EA. Implementation of the preferred alternatives, noted with an asterisk, is therefore pending fund availability. Additional funds could become available to the Provide and Enhance Recreational Opportunities restoration type for various reasons (e.g., project cancellation or modification, projects under budget), at which time the AL TIG could allocate those recreational use funds to the preferred alternatives, consistent with this RP III/EA, through TIG resolution.

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1.0 INTRODUCTION

The Alabama Trustee Implementation Group (AL TIG) prepared this Alabama Trustee Implementation Group Draft Restoration Plan III and Environmental Assessment: Provide and Enhance Recreational Opportunities and Birds (RP III/EA or plan) to continue restoration of lost natural resources and their services in Alabama as a result of the Deepwater Horizon (DWH) oil spill. The AL TIG is responsible for restoring the natural resources and resource services in the Alabama Restoration Area that were injured by the DWH oil spill and the associated spill response efforts. The AL TIG prepared this Draft RP III/EA to (1) inform the public about its DWH natural resource damage assessment (NRDA) restoration planning efforts, (2) analyze the potential restoration benefits and environmental consequences of a reasonable range of projects/alternatives that would meet the purpose and need, and (3) seek public comment on the restoration alternatives considered in this document.

1.1 BACKGROUND AND SUMMARY OF THE SETTLEMENT, RESTORATION PLANNING, AND AUTHORITIES AND REQUIREMENTS

In response to the April 20, 2010, DWH oil spill, in February 2016, the Deepwater Horizon Oil Spill Natural Resource Damage Assessment Trustees (DWH Trustees) issued the Deepwater Horizon Oil Spill: Final Programmatic Damage Assessment and Restoration Plan/Programmatic Environmental Impact Statement (PDARP/PEIS[2]) detailing a specific proposed plan to select and implement restoration projects across the Gulf of Mexico region over a 15-year period. As a programmatic restoration plan, the PDARP/PEIS provides direction and guidance for identifying, evaluating, and selecting future restoration projects to be carried out by the Trustee Implementation Groups (TIGs) (Section 5.10.4 and Chapter 7 of the PDARP/PEIS) and is the document from which future restoration plans, including this Draft RP III/EA, tier.

In March 2016, the DWH Trustees published a Notice of Availability of a Record of Decision for the PDARP/PEIS. Based on the DWH Trustees' injury determination established in the PDARP/PEIS, the Record of Decision set forth the basis for the DWH Trustees' decision to select Alternative A: Comprehensive Integrated Ecosystem Alternative. In April 2016, the United States District Court for the Eastern District of Louisiana entered a Consent Decree resolving civil claims by the DWH Trustees against BP Exploration and Production Inc. (BP) arising from the DWH oil spill.[3] This historic settlement resolves the DWH Trustees' claims against BP for natural resources damages under the Oil Pollution Act (OPA) of 1990. As part of the settlement, the settlement proceeds are allocated to the DWH Trustees to conduct restoration within specific Restoration Areas and for specific Restoration Types.

1.1.1 Oil Pollution Act

The DWH oil spill was subject to the provisions of OPA (33 United States Code [U.S.C.] §§ 2701 et seq.), which address preventing and responding to oil pollution incidents in navigable waters, adjoining shorelines, and the exclusive economic zone of the United States. The primary goal of OPA is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving an oil discharge (or substantial threat of an oil discharge). Under the authority of OPA, a council of federal and state DWH Trustees was established on behalf of the public to assess natural resource injuries resulting from the DWH oil spill and to work to make the environment and public whole for those injuries. For more information on the Trustee Council, including the federal and state

[2] The final PDARP/PEIS can be found at http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan

[3] See *United States v. BPXP et al.*, Civ. No. 10-4536, centralized in MDL 2179, In re: Oil Spill by the Oil Rig "*Deepwater Horizon*" in the Gulf of Mexico, on April 20, 2010 (E.D. La.)

agencies that are designated Trustees under OPA for the DWH oil spill, please see Chapter 7 of the PDARP/PEIS, incorporated by reference herein.

The AL TIG consists of two state Trustee agencies and four federal Trustee agencies:

- Alabama Department of Conservation and Natural Resources (ADCNR)
- Geological Survey of Alabama
- United States Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA)
- United States Department of the Interior (USDOI), represented by the United States Fish and Wildlife Service (USFWS), Bureau of Land Management, and National Park Service.
- United States Department of Agriculture (USDA)
- United States Environmental Protection Agency (USEPA)

1.1.2 National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. §§ 4321 et seq.) and Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations [CFR] §1500.1 et seq.) apply to restoration actions by federal trustees. The DWH Trustees conducted a programmatic NEPA analysis in the PDARP/PEIS from which subsequent DWH restoration plans could tier their site-specific NEPA analyses, as provided for in 40 CFR 1508.28. The conditions and environmental effects described in the PDARP/PEIS are still valid; therefore, the NEPA analysis in this Draft RP III/EA tiers from the PDARP/PEIS programmatic NEPA analysis (See also, USDOI NEPA regulations at 43 CFR 46.140).

1.1.3 Lead, Cooperating Agencies, and Intent to Adopt

For this restoration plan, USDOI serves as the lead federal agency for NEPA compliance. Each of the other federal and state co-Trustees are participating as cooperating agencies pursuant to NEPA (40 CFR 1508.5). In accordance with 40 CFR 1506.3(a), each of the three federal cooperating agencies (USDA, USEPA, and NOAA) will review the RP III/EA for adequacy in meeting the standards set forth in their own NEPA implementing procedures and decide whether to adopt the analysis in this document.

1.2 PLANNING BY THE AL TIG TO DATE

Restoration planning from the DWH oil spill began in Alabama under Early Restoration, which included projects in four of the Early Restoration phases, and continued by implementing two restoration plans following the 2016 settlement described in Appendix B. Table 1-1 shows the funds allocated to date per Restoration Type. The data regarding total allocations and allocations to restoration projects previously approved do not account for project modifications, terminations, or the availability of additional interest funds. As a result, amounts do not reflect a final balance sheet with regard to available funds under each restoration type, but nevertheless, the projects proposed in this Draft RP III/EA will not exceed funds allocated for specific resource types (see Table 1-2). Section 6.5.3.1 of the DWH Administrative Record presents more information about project changes adopted by the AL TIG.[4] Chapter 2 of the Final PDARP/PEIS presents additional details about the background of the DWH oil spill, the impact of the spill on the Gulf of Mexico ecosystem, and additional context for the settlement and allocation of funds.

[4] Available at www.doi.gov/deepwaterhorizon/adminrecord

Table 1-1: Allocation of Deepwater Horizon Settlement Funds for the Alabama Restoration Area by Restoration Type

Final PDARP/PEIS Programmatic Restoration Goals and Underlying Restoration Types	Alabama Total Allocation	Previously Allocated to Restoration Projects
1. Restore and Conserve Habitat	**$96,110,000**	
Wetlands, Coastal, and Nearshore Habitats	$65,000,000	$13,817,810
Habitat Projects on Federally Managed Lands	$3,000,000	$434,001
Early Restoration		$28,110,000
2. Restore Water Quality	**$5,000,000**	
Nutrient Reduction (Nonpoint Source)	$5,000,000	$3,479,090
3. Replenish and Protect Living Coastal and Marine Resources	**$53,974,000**	
Sea Turtles	$5,500,000	$4,096,546
Marine Mammals	$5,000,000	$3,118,763
Birds	$30,000,000	$2,372,725
Early Restoration Birds		$145,000
Oysters	$10,000,000	$4,521,333
Early Restoration Oysters		$3,329,000
4. Provide and Enhance Recreational Opportunities	**$110,505,305**	
Early Restoration of Recreational Loss and AL TIG Restoration Plan I/Environmental Impact Statement		$99,900,305
5. Monitoring, Adaptive Management, Administrative Oversight	**$30,000,000**	
Monitoring and Adaptive Management	$10,000,000	$3,508,766
Administrative Oversight and Comprehensive Planning	$20,000,000	
TOTAL	**$295,589,305**	**$166,813,339**

Source: DWH Consent Decree (available at: https://www.justice.gov/enrd/deepwater-horizon)

1.3 RESTORATION PURPOSE AND NEED

The purpose of restoration, as discussed in this document and detailed more fully in the PDARP/PEIS, is to make the environment and the public whole for injuries resulting from the DWH oil spill (NOAA, 2016). Designated Trustees accomplish this by implementing restoration actions that return injured natural resources and resource services to baseline conditions and compensate for interim losses in accordance with OPA NRDA regulations.

The AL TIG has undertaken this restoration planning effort to meet the purpose of contributing to the compensation for and restoration of natural resources and resource services injured in the Alabama

Restoration Area as a result of the DWH oil spill. Specifically, this Draft RP III/EA addresses restoration of two Restoration Types injured by the DWH oil spill: Provide and Enhance Recreational Opportunities[5] and Birds. As described in Section 5.3 of the Final PDARP/PEIS, the five Trustee programmatic restoration goals work independently and together to benefit injured resources and services. The alternatives presented in this Draft RP III/EA address two of the five Trustee programmatic restoration goals: (1) provide and enhance recreational opportunities, and (2) restore and conserve habitat. Section 5.3.2 of the Final PDARP/PEIS presents additional information about the purpose and need for the DWH NRDA restoration.

1.4 PROPOSED ACTION: IMPLEMENTATION OF THE AL TIG RP III/EA

To meet the above stated purpose and need, the AL TIG proposes to implement its preferred alternatives addressing injury to Restoration Types "Provide and Enhance Recreational Opportunities" and "Birds." Table 1-2 identifies the preferred alternatives. The AL TIG proposes to implement the preferred alternatives using approximately $22,000,000 in DWH settlement funds in accordance with the Consent Decree.

1.5 REASONABLE RANGE OF ALTERNATIVES

The Trustees are considering a reasonable range of restoration alternatives before selecting their preferred alternative(s) (OPA § 990.53; 42 U.S.C. §§ 4321 et seq.). Chapter 2 of this Draft RP III/EA summarizes the screening process used to develop a reasonable range of alternatives, consistent with the OPA NRDA regulations. Table 1-2 identifies the alternatives that compose the reasonable range for this Draft RP III/EA, including those preferred by the AL TIG for implementation at this time. The project descriptions for the alternatives listed in Table 1-2 and shown in Figure 1-1 are detailed in Chapter 2. Pursuant to NEPA, this Draft RP III/EA also considers a No Action alternative.[6]

1.6 SEVERABILITY OF PROJECTS

The alternatives presented in this Draft RP III/EA are independent of each other and may be individually selected for implementation. A decision to not select one or more of the alternatives does not affect the AL TIG's selection of any remaining alternatives. Projects not included in the reasonable range of alternatives for this Draft RP III/EA or not selected for implementation in the Final RP III/EA may continue to be considered for inclusion in future restoration plans by the AL TIG.

[5] The restoration type "Provide and Enhance Recreational Opportunities" may be referred to in this document as "recreational use." For the purposes of this Draft RP III/EA, these two terms are used interchangeably.

[6] Under the OPA NRDA regulations, Trustees must analyze a similar "natural recovery" alternative, the PDARP analyzed and concluded that this alternative would not meet the Trustees' restoration goals. See Chapter 2, Section 2.8, below, for a more detailed discussion of why no further OPA analysis of natural recovery is conducted for RP III.

Table 1-2: Reasonable Range of Alternatives and Associated Costs

Alternative	Preferred Y/N	Project Costs
Restoration Type—Provide and Enhance Recreational Opportunities		
No Action	N	$0
Perdido River Land Acquisition (Molpus Tract)	Y	$4,742,540
Bayfront Park Restoration and Improvement Phases IIa and IIb	Y	$4,683,304
Bayfront Park Restoration and Improvement Phase IIa	N	$3,631,679
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Total Funding for Preferred Alternatives		**$22,095,361**

* The Trustees are not proposing to exceed the allocation for Provide and Enhance Recreational Opportunities in this RP III/EA. Implementation of the preferred alternatives, noted with an asterisk, is therefore pending fund availability. Additional funds could become available to the Provide and Enhance Recreational Opportunities restoration type for various reasons (e.g., project cancellation or modification, projects under budget), at which time the AL TIG could allocate those recreational use funds to the preferred alternatives, consistent with this RP III/EA, through TIG resolution.

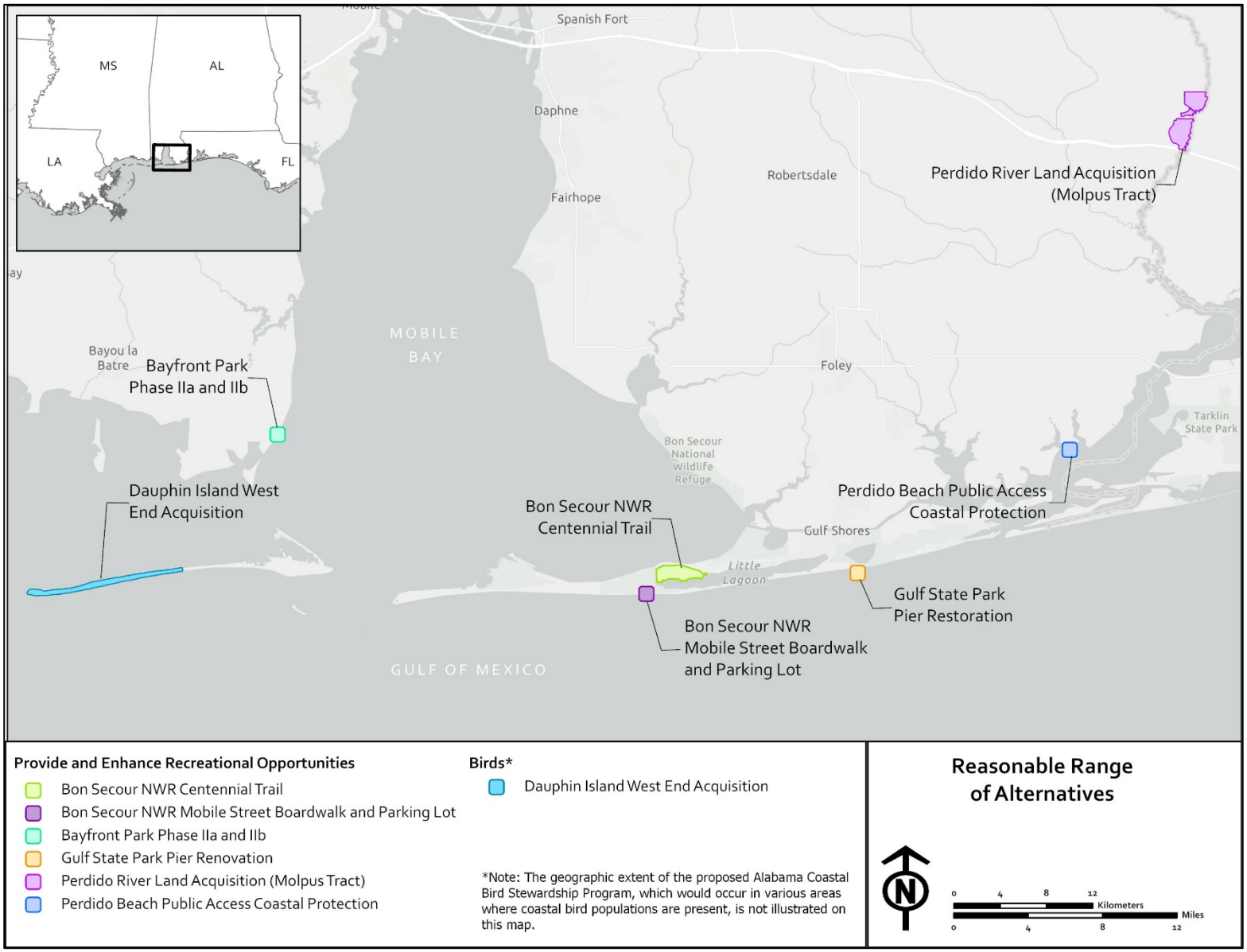

Figure 1-1: Vicinity Map for the Alternatives in the Draft RP III/EA

1.7 COORDINATION WITH OTHER GULF RESTORATION PROGRAMS

The DWH Trustees are committed to coordinating with other Gulf of Mexico restoration programs to maximize the overall ecosystem benefits from DWH NRDA restoration efforts. During the course of the restoration planning process, the AL TIG coordinated with and will continue to coordinate with other DWH oil spill and Gulf of Mexico restoration programs, including the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act as implemented by the Gulf Coast Ecosystem Restoration Council (RESTORE Act); the Gulf Environmental Benefit Fund (GEBF) managed by the National Fish and Wildlife Foundation (NFWF); and other state and federal funding sources. Efforts occurring through other programs are further described at: https://www.alabamacoastalrestoration.org/. These other restoration efforts are considered in the analysis of cumulative impacts in this Draft RP III/EA (Chapter 4). More details about coordination can be found in Section 1.5.6 of the Final PDARP/PEIS. Examples of this coordination include the proposed continuation and expansion of bird stewardship activities previously funded by the NFWF GEBF and the proposed implementation of improvements at Bayfront Park, which is supported by funding from the NRDA Restoration Plan I for the completion of Engineering and Design Activities. Proposed construction of trails and improvements at the Bon Secour National Wildlife Refuge (BSNWR) supports an ongoing effort to acquire, conserve, and make available lands and resources in Baldwin County for public enjoyment. Previously funded projects related to this proposed project include: Bon Secour National Wildlife Refuge Trail Enhancement (Final Phase IV Early Restoration Plan [ERP]/ EAs),[7] Bon Secour-Oyster Bay Wetland Acquisition Project (NFWF GEBF), Gulf Highlands Conservation Acquisition (NFWF GEBF), Alabama Dune Restoration Cooperative Project (NRDA Phase I Early Restoration).

1.8 PUBLIC INVOLVEMENT

Public input, an integral part of NEPA, OPA, and the DWH oil spill restoration planning effort, has been ongoing since October 1, 2010, when the DWH Trustees published a Notice of Intent to Conduct Restoration Planning (75 CFR 60800). Since then, the DWH Trustees, including the AL TIG Trustees, have sought restoration project ideas from the public for the Alabama Restoration Area through two websites: the NOAA Gulf Spill web portal at http://www.gulfspillrestoration.noaa.gov and the ADCNR Project Portal at http://www.alabamacoastalrestoration.org/. In preparation for the Draft RP III/EA planning process, on December 19, 2018, the AL TIG requested that the public submit project ideas through these two websites for projects in the Alabama Restoration Area, asking the public to focus their input on Provide and Enhance Recreational Opportunities and Birds Restoration Types.

1.8.1 Public Comment Period

The public is encouraged to review and comment on this Draft RP III/EA. Following public notice, the document will be available to the public for a 30-day comment period. The deadline for submitting written comments on the Draft RP III/EA is specified in the public notice published in the *Federal Register* and on the DWH Trustee website (https://www.gulfspillrestoration.noaa.gov/restoration-areas/alabama). Written comments must be postmarked no later than 30 days after the start of the comment period. Comments can be submitted by one of following methods:

- Online at: http://parkplanning.nps.gov/restorealabamaP3
- By mail (hard copy) addressed to: U.S. Fish and Wildlife Service, P.O. Box 29649, Atlanta, GA 30345
- In-person at the public meeting on September 11, 2019 (information below)

Please note that personal identifying information included in submitted comments (e.g., address, phone number, and email address) may be made publicly available.

[7] https://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Final-Phase-IV-ERP-EA.pdf

1.8.2 Public Meeting Information

The AL TIG will hold an open house public meeting to facilitate the public review and comment process for the Draft RP III/EA on September 11, 2019, at 6:00 p.m. at the Five Rivers Tensaw Theater, located at 30945 Five Rivers Boulevard in Spanish Fort, Alabama. This meeting will also serve as the annual meeting of the AL TIG. The meeting date and time is also specified in the *Federal Register* notice announcing release of this document. After the close of the public comment period, the AL TIG will consider all comments received and revise the Draft RP III/EA as appropriate. A summary of comments received and the AL TIG's responses (where applicable) will be included in the Final RP III/EA.

1.8.3 Decisions to Be Made

This Draft RP III/EA is intended to provide the public with information and analyses needed to enable meaningful review and comment on the AL TIG's proposal to proceed with selection and implementation of one or more of the alternatives proposed in this plan.

1.8.4 Administrative Record

The DWH Trustees opened a publicly available Administrative Record for the NRDA for the DWH oil spill, including restoration planning activities, concurrently with publication of the 2010 Notice of Intent (pursuant to 15 CFR 990.45). USDOI is the lead federal Trustee for maintaining the Administrative Record, which can be found at http://www.doi.gov/deepwaterhorizon/adminrecord.

2.0 RESTORATION PLANNING PROCESS: SCREENING AND ALTERNATIVES

NRDA restoration under OPA is a process that includes evaluating injuries to natural resources and resource services to determine the types and extent of restoration needed to address the injuries. Restoration activities must produce benefits that are related to or have a nexus (connection) to natural resource injuries and service losses resulting from a spill. Trustees identify a reasonable range of restoration alternatives and then evaluate those proposed alternatives. The OPA NRDA regulations (15 CFR 990.54) provide factors for Trustees to consider when evaluating projects designed to compensate the public for injuries caused by oil spills. Following the OPA regulations (15 CFR 990.53), the AL TIG developed a screening process to identify a reasonable range of alternatives to be further evaluated in this Draft RP III/EA. This chapter describes the screening process that the AL TIG used to identify a reasonable range of alternatives to include in this Draft RP III/EA for evaluation under both OPA and NEPA. The reasonable range of alternatives identified is consistent with the DWH Trustees' selected programmatic alternative and the goals identified in the Final PDARP/PEIS. The restoration planning process was also conducted in accordance with the Consent Decree, 2016 Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH oil spill (Trustee Council SOPs), OPA regulations, and NEPA regulations.

2.1 SUMMARY OF INJURIES ADDRESSED IN THE DRAFT RP III/EA

The DWH oil spill introduced numerous contaminants into the environment. Chapter 4 of the Final PDARP/PEIS summarizes the injury assessment and documents the nature, degree, and extent of injuries from the incident to both natural resources and the services they provide. Restoration projects proposed in this Draft RP III/EA and in future AL TIG restoration plans are designed to address injuries in the Alabama Restoration Area resulting from the incident. This Draft RP III/EA proposes alternatives for the following Restoration Types described in the Final PDARP/PEIS: Provide and Enhance Recreational Opportunities and Birds. This section summarizes the information on injures from the Final PDARP/PEIS injury assessment (Chapter 4), with specific reference to the injuries in Alabama. The selection of the restoration alternatives proposed in this plan is informed by the assessment of injuries.

2.1.1 Provide and Enhance Recreational Opportunities

The DWH Trustees evaluated losses to recreational users as part of the injury assessment (Final PDARP/PEIS, Section 4.10, incorporated by reference herein.

In general, the DWH lost recreational use injury assessment covered two broad categories of recreation—shoreline use and boating. Shoreline use refers to recreational activities at locations near beaches and other shoreline areas and includes swimming, sunbathing, surfing, walking, kayaking, and fishing from the shore or shoreline structures (i.e., piers). It also includes fishing at sites that are considered coastal but are not directly on the beach. Specifically excluded from the shoreline use assessment are recreational boating, commercial activities, and DWH oil spill response. Boating includes recreational boating activities that begin at sites providing access to salt water near the Gulf Coast. The term "sites" encompasses a variety of locations providing boat access to coastal waters, including marinas, unimproved launches, and private residences. Excluded from this category are non-recreational boating activities, including commercial fishing, law enforcement/safety, and DWH oil spill response. For more information on the impacts on recreational opportunities caused by the DWH oil spill, see Section 4.10 of the PDARP. This Draft RP III/EA addresses shoreline use and boating injuries in the Alabama Restoration Area through the development and selection of projects funded with TIG monies allocated to Provide and Enhance Recreational Opportunities.

2.1.2 Birds

The DWH Trustees evaluated impacts on birds as part of the injury assessment (Final PDARP/PEIS, Section 4.7). At least 93 species of birds, including both resident and migratory species and across all five Gulf Coast states, were exposed to DWH oil in multiple northern Gulf of Mexico habitats, including open water, islands, beaches, bays, and marshes. For more information on the impacts on birds caused by the DWH oil spill, see Section 4.7 of the PDARP. This RP III/EA addresses all types of bird injuries in the Alabama Restoration Area through the development and selection of projects funded with monies allocated to the TIG to Replenish and Protect Living Coastal Resources—Birds.

2.2 SCREENING FOR REASONABLE RANGE OF ALTERNATIVES

As described in Chapter 1, this Draft RP III/EA continues the restoration planning process that began during Early Restoration and was continued by the AL TIG in the Restoration Plan I/Environmental Impact Statement (RP I/EIS) and the Restoration Plan II/Environmental Assessment (RP II/EA). In this Draft RP III/EA, the AL TIG is focusing on projects for two of the Restoration Types identified in the Final PDARP/PEIS: Provide and Enhance Recreational Opportunities and Birds. The AL TIG selected these Restoration Types for RP III/EA because at this time, the benefits of further investment of restoration funds in these Restoration Types are expected to be substantial. The screening process yielded ten projects for more detailed OPA and NEPA analysis across the two Restoration Types. The remainder of this chapter discusses the screening process and includes detailed descriptions of the ten projects organized by Restoration Type.

2.3 RESTORATION PROJECT SCREENING OVERVIEW

The goal of the AL TIG's screening process is to identify a set of restoration projects that provide a reasonable range of alternatives for compensating the public, at least partially, for recreational use and bird natural resource injuries. The results of the screening represent those restoration projects that, based on preliminary investigation, have a reasonable likelihood of satisfying the selection criteria without causing adverse environmental impacts, recognizing that a lack of adverse impacts cannot be assured until more thorough OPA/NEPA evaluations are completed.

The RP III/EA phased and sequential screening process was tiered from the analysis conducted for RP I/EIS and RP II/EA and included three primary steps. Step 1 determined whether a project addressed one of the two restoration types under consideration. Step 2 evaluated the proposed project against the Trustees' restoration goals and other general criteria using the limited information available in the project submissions. In Step 3, projects that met the Step 2 criteria were evaluated more fully to determine their appropriateness for consideration as part of the Trustees' reasonable range of alternatives. Appendix C presents a more detailed discussion of the screening methodology and criteria.

2.3.1 Screening Recreational Use Restoration Projects

Based on its review of the Final PDARP/PEIS goals and knowledge of local restoration needs and conditions, the AL TIG developed the following restoration goals for recreational use restoration projects considered in this plan. At a minimum:

1. Projects must (i) compensate for lost shoreline use or (ii) compensate for lost boating or boat fishing.
2. Projects must have a nexus to the injury caused by the DWH oil spill. Shoreline use projects are only considered to have a nexus if they are on or near the barrier island and ocean-facing beaches of Dauphin Island, Fort Morgan, Orange Beach, and Gulf Shores. Boating and boat fishing projects are considered to have a nexus as long as they provide relatively direct boating

or boat fishing access to Alabama's nearshore and coastal waters or enhance the coastal boating or boat fishing experience.

The tiering from RP I/EIS coupled with the Step 1 screening process for projects submitted since the RP I/EIS identified 62 potential recreational use projects for consideration in the RP III/EA. Of these, 49 were Shoreline Use and 13 were Boating projects.

In Step 2, the AL TIG evaluated projects against the Trustees' restoration goals and other Step 2 criteria cited in Appendix C. Based on the Step 2 evaluations, the AL TIG determined that 17 of the 49 Shoreline Use projects passed the Step 2 criteria and were advanced for Step 3 evaluation. Of the Shoreline Use projects not advanced, 12 were duplicative of the work of projects that were advanced, 13 did not have an adequate shoreline nexus to the DWH oil spill, and the remaining 7 had already been fully funded or represented planning or feasibility studies that did not meet the AL TIG's requirements for active restoration. For Boating projects, the Step 2 screening process advanced 8 of the 13 projects for Step 3 consideration. Of the projects not advanced, 2 were duplicative of the work of projects that were advanced, 2 were already fully funded, and 1 was beyond the geographic scope of this restoration plan.

During the more detailed Step 3 evaluation and refinement of Shoreline Use and Boating projects, the AL TIG considered the 25 remaining projects advanced from Step 2.[8] Of the 17 Shoreline Use and 8 Boating projects, the AL TIG advanced 5 projects for consideration in the reasonable range of alternatives for recreational use projects in this Draft RP III/EA. The reasons for not advancing the other 20 projects to the reasonable range of alternatives involved project- and site-specific considerations. In some cases, project costs exceeded the budgets available for this restoration plan. In others, further investigation and project development revealed that a project would not effectively meet the Trustees' recreational objectives in Alabama or that a decision should be deferred pending the outcome of an ongoing study. In several cases, project proponents indicated they did not wish to pursue NRDA funding for the initiative at this time.

Based on the Step 3 screening and further refinement of project options, the AL TIG selected the following recreational use projects for inclusion in the reasonable range of alternatives for this Draft RP III/EA:

- Perdido River Land Acquisition (Molpus Tract)
- Bayfront Park Restoration and Improvement Phase IIa and IIb[9]
- Bayfront Park Restoration and Improvement Phase IIa
- Gulf State Park Pier Renovation
- Perdido Beach Public Access Coastal Protection
- BSNWR Recreation Enhancements – Mobile Street Boardwalk[10]

[8] The AL TIG developed the more focused Perdido River Land Acquisition (Molpus Tract) to replace the broader initiative submitted under Project ID 318.

[9] In the final formulation of the reasonable range for this Draft RP III/EA, the Trustees elected to create two variants of the Bayfront Park alternative to establish a wider range of funding options available for consideration during the evaluation and identification of preferred alternatives.

[10] In the final formulation of the reasonable range for this Draft RP III/EA, the Trustees elected to create two variants of the BSNWR Recreational Enhancements alternative to establish a wider range of funding options available for consideration during the evaluation and identification of preferred alternatives.

- BSNWR Recreation Enhancements – Centennial Trail Boardwalk

Overall, the seven reasonable range projects all have a nexus to the DWH oil spill and provide appropriate compensation for lost recreational use. The remainder of Chapter 2 describes these projects in greater detail, and Appendix D presents the reason (or reasons) that a project was not carried forward at this time.

2.3.2 Screening Bird Restoration Projects

Based on its review of the Final PDARP/PEIS goals and knowledge of local restoration needs and conditions, the AL TIG developed the following Alabama-specific restoration goals for Bird restoration projects for this plan. At a minimum:

1. Projects must increase reproduction or decrease mortality for DWH injured species; or
2. Fill important information/data gaps needed to inform future bird restoration efforts in the Alabama Restoration Area.

The tiering from RP II/EA coupled with the Step 1 eligibility screening for new projects submitted since the RP II/EA identified 13 potential Bird restoration projects for consideration in this Draft RP III/EA.

In Step 2, the AL TIG evaluated these projects against the TIG's restoration goals and considered whether the projects would be more appropriate for implementation by a TIG addressing a geographic scope beyond that considered by the AL TIG (e.g., Open Ocean) or potentially as part of a future, joint restoration plan. Based on the Step 2 evaluations, the AL TIG determined that 3 of the 13 projects did not meet the Step 2 criteria. Two of the projects appear to be more appropriately conducted at a broader geographic scope than is being considered by the AL TIG. The third project is already fully funded.

During the more detailed Step 3 evaluation and refinement of Bird restoration projects, the AL TIG advanced two of the remaining ten projects to the reasonable range and advanced one new project. The new project draws on elements from three bird projects that have similar objectives and overlapping scopes of work but were not advanced to the reasonable range from Step 3. In addition, two other Step 3 projects were deemed duplicative with the AL TIG RP II/EA Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species project and were not advanced, and one other project did not meet the Trustees' goal of focusing on stewardship of nesting habitat. The remaining two projects were not advanced—one because it lacked specificity and the other because it would not be a cost-effective approach based solely on bird restoration benefits. Based on the Step 3 screening and further refinement of project options, the AL TIG selected the following Bird restoration projects for inclusion in the reasonable range of alternatives.

- Stewardship of Coastal Alabama Beach Nesting Bird Habitat
- Stewardship of Coastal Alabama Beach Nesting Bird Habitat—Stewardship and Monitoring Only
- Dauphin Island West End Acquisition

These projects directly address the AL TIG's restoration goals for Bird restoration projects in this Draft RP III/EA by facilitating protection and restoration of bird habitat and by filling important data gaps. All three projects are described in greater detail in the remainder of Chapter 2.

2.3.3 Screening Process Summary

The AL TIG decisions to advance projects from Step 3 to the reasonable range of alternatives are based on balancing the considerations outlined above and within the context of the full suite of restoration alternatives being advanced for analysis. As a result, a project considered in Step 3 may have received a

generally favorable review, but the AL TIG may still have decided not to advance it to the reasonable range of alternatives for this plan. Appendix D presents the reason (or reasons) a project was not carried forward at this time. The remainder of this section discusses the screening process, by Restoration Type, and the rationale for the results.

2.4 ALTERNATIVES NOT CONSIDERED FOR FURTHER EVALUATION IN THIS PLAN

A number of projects considered during screening were ultimately not selected by the AL TIG for inclusion in the reasonable range of alternatives for this plan. The AL TIG's decisions to advance projects to the reasonable range of alternatives are based on balancing the considerations outlined above and have been taken in the context of the full suite of restoration alternatives being advanced for analysis in this restoration plan. As a result, while a project considered in Step 3 may have received a generally favorable review, the AL TIG may still have decided not to advance it to the reasonable range of alternatives for this plan. While these projects have restoration potential and may be evaluated and potentially selected in a future restoration plan, they are not considered for further evaluation under OPA or NEPA in this plan.

2.5 REASONABLE RANGE OF RESTORATION ALTERNATIVES CONSIDERED

In Table 1-2, the AL TIG lists the reasonable range of alternatives evaluated in this plan and identifies its preferred restoration alternatives. All restoration alternatives, including a No Action alternative evaluated in this Draft RP III/EA, were reviewed pursuant to OPA and NEPA.

2.6 PROVIDE AND ENHANCE RECREATIONAL OPPORTUNITIES

Project screening in the Provide and Enhance Recreational Opportunities Restoration Type identified seven projects for inclusion in the reasonable range of alternatives. The no action alternative was also evaluated pursuant to the requirements of NEPA. Table 1-2 in Chapter 1 presents the seven projects and their anticipated costs.

2.6.1 Perdido River Land Acquisition (Molpus Tract)

Project Summary/Background. This project would acquire and place in conservation 1,391 acres of coastal habitat on the Perdido River. The project was originally considered in the AL TIG RP II/EA as a Wetlands, Coastal, and Nearshore project but was not carried forward. The project was revisited and determined to be more appropriate for the Provide and Enhance Recreational Opportunities Restoration Type. The Molpus Tract covers more than 4 miles of riverfront on the Perdido River and is immediately south of and contiguous with the Perdido Wildlife Management Area (WMA). Of the 1,391 acres proposed for purchase, approximately 686 acres are upland and 705 acres are wetland (Figure 2-1). ADCNR would own and manage the land. Management would include hydrologic restoration as needed and the use of clearing and prescribed burns over time to return the appropriate acreage to longleaf pine.

The project would include recreational improvements to the property, including a canoe/kayak launch that would link this property to the Perdido River Canoe Trail and provide an additional point of access to the river for the public (Alabama Canoe Trails, 2019). Signage educating the public about the area's flora and fauna, the Perdido WMA, and the Perdido River Canoe Trail would also be developed and installed near the launch. Acquisition of the Molpus Tract is strategic because it would place large amounts of acreage into conservation. When considered holistically with publicly held land on the Alabama and Florida sides of the Perdido River, it is an important acquisition in the ongoing effort to place the Perdido River corridor in conservation. ADCNR would serve as the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. Due diligence and land acquisition would take approximately 1.5 years. After closing, installation of the canoe/kayak launch, permeable parking, and educational signage would follow and would take approximately 6 months to 1 year to complete.

Proposed Infrastructure/Improvements. The canoe/kayak launch, parking area improvements, and educational signage would be designed and installed in the smallest footprint possible using low-impact, permeable materials. Estimated dimensions of proposed canoe/kayak launch includes three 8-foot by 20-foot paver pads. This project would also include parking area improvements, which would create an estimated 10 to 15 parking spaces for the public. The acquisition would include an appropriate land protection instrument (i.e., deed restriction or conservation easement) to ensure that the purpose of restoration and recreational use, as described in this plan, is maintained in perpetuity.

Operation and Maintenance Requirements. ADCNR would manage the property as part of the Perdido WMA. Some areas of the property may need to have loblolly and slash pine thinned to return the area to a longleaf pine ecosystem. Prescribed burns could also be implemented as part of the Perdido WMA management strategy. Five years of management support for ADCNR would also be necessary to properly manage the increase in acreage to the WMA.

Project Monitoring Summary. Upon successful purchase of the property, ADCNR would use an existing management plan to effectively manage the property. Appendix E provides the monitoring and adaptive management (MAM) plan with a summary of monitoring activities.

Costs. The estimated project cost is $4,742,540 and would include funds for planning and design, acquisition, construction, monitoring, operations and maintenance, and Trustee oversight.

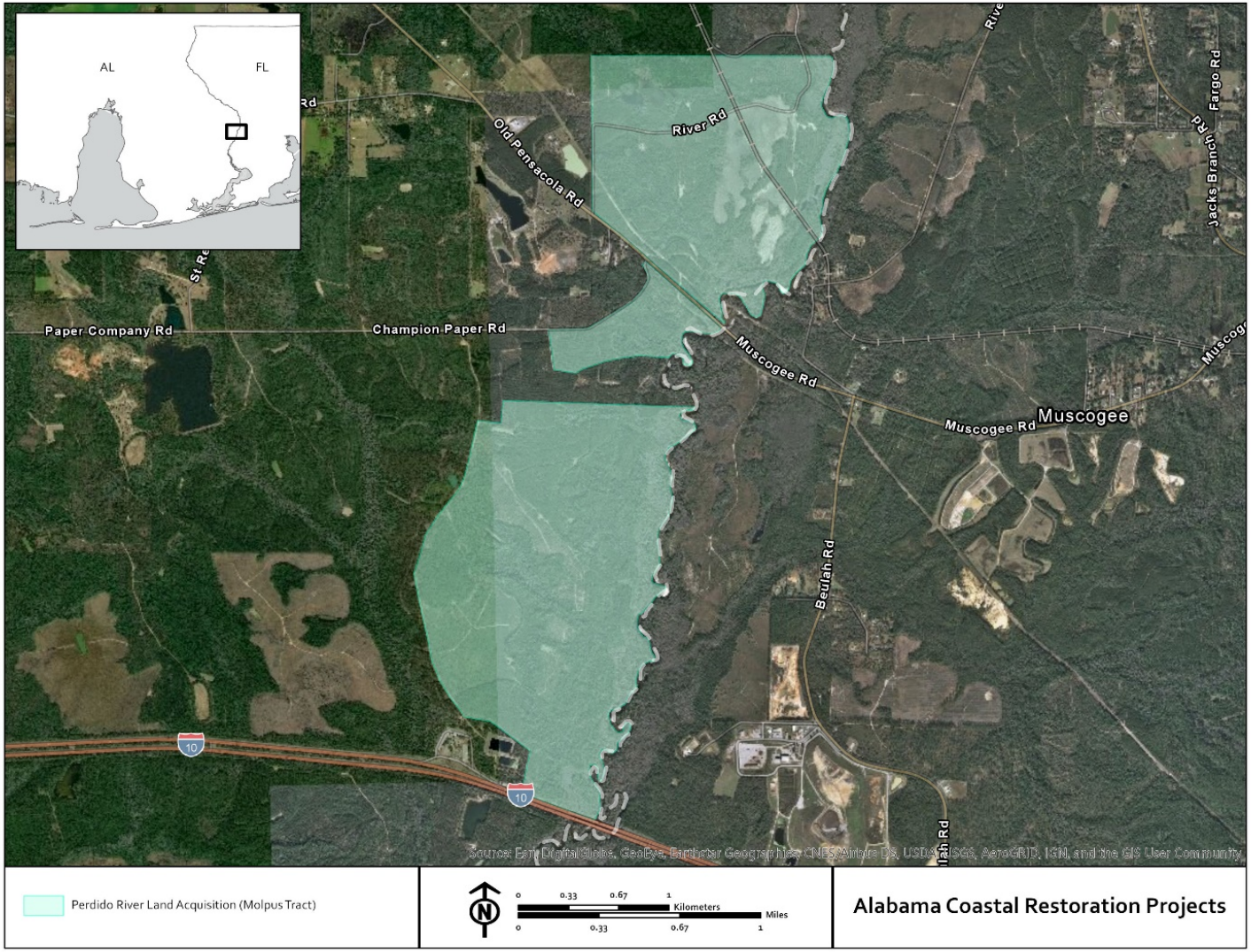

Figure 2-1: Location of the Perdido River Land Acquisition (Molpus Tract)

2.6.2 Bayfront Park Restoration and Improvement—Phases IIa and IIb

Project Summary/Background. Bayfront Park is a publicly accessible outdoor recreation area located on Dauphin Island Parkway near the Alabama Port community. Phase I for this project included funds for engineering and design (E&D) work to develop the concept to enhance Mobile County's Bayfront Park and was funded by the AL TIG RP I/EIS Bayfront Park Restoration and Improvement (E&D only) project. The resulting master plan broke down construction activities into two phases, hereby known as Phases IIa and IIb. The project described in this Draft RP III/EA would implement Phases IIa and IIb of shoreline recreational improvements developed under Phase I at Bayfront Park on Dauphin Island Parkway near the Alabama Port community. Enhancements would facilitate public access and improve recreational amenities (Figure 2-2). The 20-acre park, operated by the Mobile County Commission, currently receives more than 300 visitors on weekends and more than 1,200 visitors per week during the peak summer months. Recreational activities currently supported at this site include biking, playground use, fishing and crabbing, picnicking, walking, exercising, paddle sports such as kayaking, and bird watching. The park provides public access to Mobile Bay and other public amenities, such as a playground, picnic areas, and restrooms. The park also provides public access to the shoreline. The Mobile County Commission owns, maintains, and staffs the park. This project would fund implementation and construction of a number of shoreline and amenity improvements in the park. Phases IIa and IIb would include the work proposed here, including construction of several park amenity improvements and a pocket beach. The proposed amenities under Phases IIa and IIb are described below under Proposed Infrastructure/Improvements. ADCNR would serve as the implementing Trustee for this project. This project would benefit the public by providing access to the natural resources in south Mobile County, while protecting coastal habitats and increasing the resilience of a major evacuation route (Dauphin Island Parkway/Highway 188). Public access to resources along the western shore of Mobile Bay is limited, and this project would improve controlled access and amenities for residents and visitors recreating on the western shore.

Proposed Infrastructure/Improvements. This project proposes to fund the Phases IIa and IIb construction of several amenities (see Figure 2-3) that would include:

Phase IIa:

- Shoreline Improvements: Stabilizing and constructing an approximately 10-acre sand pocket beach in front of existing riprap with breakwaters and groins to be added if advised by a coastal engineer.
- Constructing civil work, including crushed aggregate access roads, concrete parking pads including Americans with Disabilities Act (ADA)-compliant parking and sidewalks for ADA-compliant access; concrete apron at the park entry as required by the Alabama Department of Transportation; and beach overlooks designed and installed in the smallest footprint possible using low-impact, permeable materials.
- Updating and replacing playground equipment with a new pavilion. These facilities would be planned for low-impact design and would use permeable pavement (e.g., for the pavilion), where appropriate. Native tree and shrubs would be added to this area to help mitigate any potential increase in stormwater runoff.
- Constructing new restroom facilities, including demolishing the existing restroom facility and replacing it with ADA-compliant restrooms and a park office that would be used only by the Mobile County staff who are managing the park.

Figure 2-2: Location of Bayfront Park Restoration and Improvement—Phases IIa and IIb

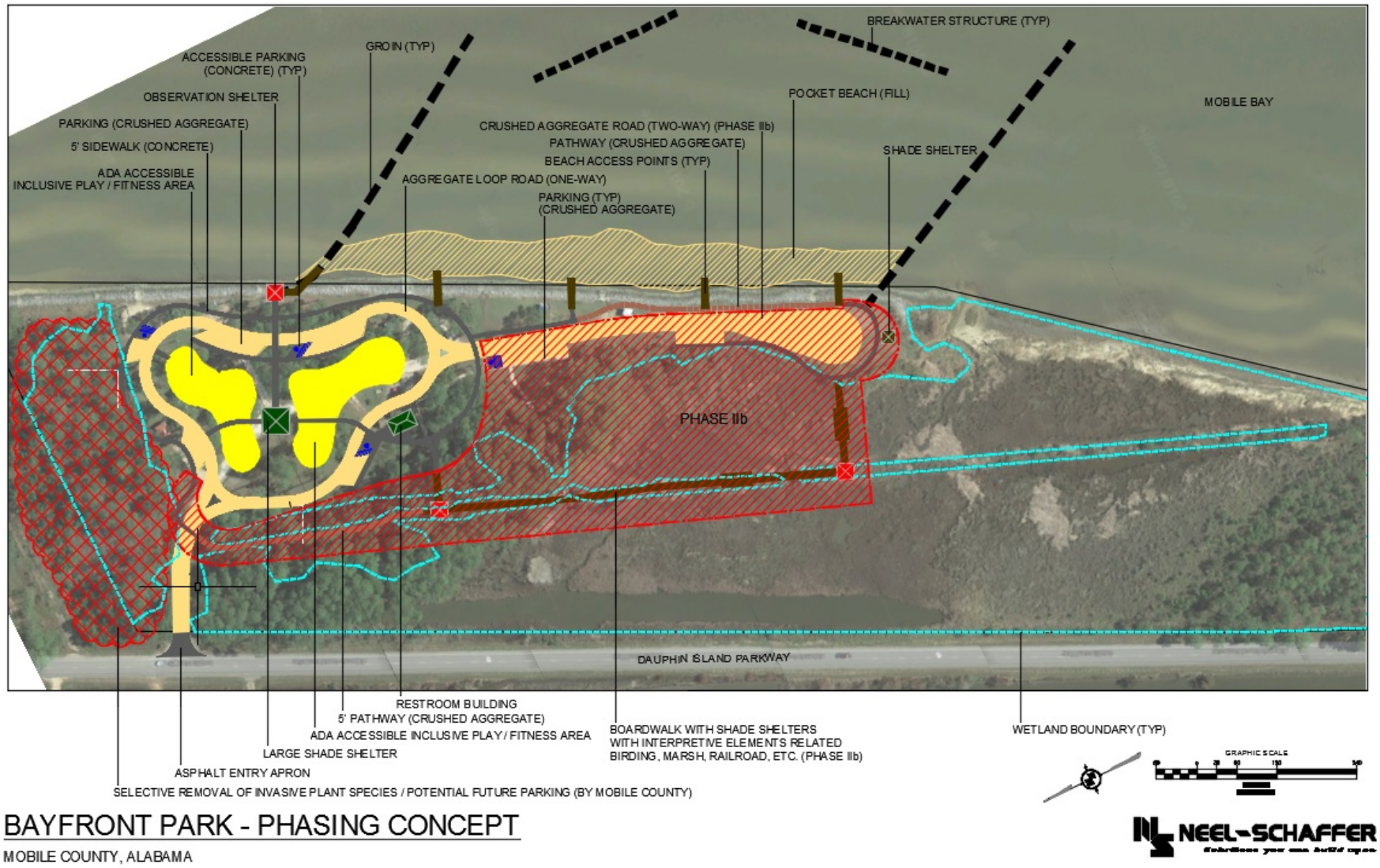

Figure 2-3: Conceptual Site Plan

Phase IIb:

- Replacing and expanding the footprint for existing boardwalk with overlooks, with a proposed dimension of approximately 2,250 linear feet.
- Adding additional crushed aggregate and concrete walkways and concrete for additional ADA-compliant parking.

Construction Methodology (or Implementation Methodology) and Timing. Planning, engineering, and design for this project has been included in a previous phase and is currently in process and approximately at the 30 percent design phase. The E&D process, including any required modeling, would be completed prior to this project moving forward. Activities proposed in this plan are for construction activities. Construction of Phase IIa shoreline improvements are contingent on the completion of modeling to determine final design/placement of materials to prevent negative impacts on adjacent shorelines and/or sediment transport. A construction, engineering, and inspection contract would be procured to obtain an engineering consultant to assist with bidding and project management. Once the bidding process is complete and a construction contract is awarded, construction would be completed in accordance with all applicable local, state, federal, and coastal compliance requirements and is not expected to last longer than 18 months.

Where impervious surfaces are proposed (such as ADA parking areas), low-impact designs would be implemented where feasible. The construction contractor would be required to use best practices and appropriate equipment for demolition and construction. Erosion control best management practices (BMPs) would be followed to protect adjacent water resources.

Operation and Maintenance Requirements. The Mobile County Commission would continue to operate and maintain the park and facilities after improvements are complete.

Project Monitoring Summary. The project would be monitored one time upon completion of construction to ensure that amenities were constructed and completed as designed. Annual monitoring of the pocket beach would occur over a 5-year period and would include profile surveys within and adjacent to placement area. A visitor use and satisfaction survey would be performed at the end of the first year upon completion of project.

Costs. The estimated project cost is $4,683,304 for construction, monitoring, operations and maintenance, and Trustee oversight. Contracting would occur on a competitive basis in accordance with applicable state and federal procurement requirements.

2.6.3 Bayfront Park Restoration and Improvement Phase IIa

Project Summary/Background. Information related to location and background of the project is the same as described above for the Bayfront Park Restoration and Improvement Phases IIa and IIb alternative. Phase IIa would only include the elements listed below under Proposed Infrastructure/Improvements and not the other construction elements described in Bayfront Park Restoration and Improvement Phases IIa and IIb above. ADCNR would serve as the implementing Trustee for this project.

Proposed Infrastructure/Improvements. The proposed Phase IIa alternative is the same as described above for the Bayfront Park Restoration and Improvement Phase II alternative, but this alternative would only include:

Phase IIa:

- Stabilizing and constructing an approximately 10-acre sand pocket beach in front of existing riprap with breakwaters and groins to be added if advised by a coastal engineer.

- Constructing civil work, including crushed aggregate access roads, concrete parking pads including ADA parking, and sidewalks for ADA-compliant access; concrete apron at the park entry as required by the Alabama Department of Transportation; and beach overlooks designed and installed in the smallest footprint possible using low-impact, permeable materials.
- Updating and replacing playground equipment with a new pavilion.
- Constructing new restroom facilities, including demolishing the existing restroom facility and replacing it with ADA-compliant restrooms and a park office that would be used only by the Mobile County staff who are managing the park.

Construction Methodology (or Implementation Methodology) and Timing. Information related to construction methodology is the same as described above under Bayfront Park Restoration and Improvement Phases IIa and IIb. Once the bidding process is complete and a construction contract is awarded, construction is expected to take place over 12 months.

Operation and Maintenance Requirements. Information related to operation and maintenance requirements are the same as described above for the Bayfront Park Restoration and Improvement Phases IIa and IIb alternative.

Project Monitoring Summary. Information related to project monitoring summary would be the same as described above for the Bayfront Park Restoration and Implementation Phases IIa and IIb alternative.

Costs. The estimated project cost is $3,631,679 and would include funds for construction, monitoring, operations and maintenance, and Trustee oversight.

2.6.4 Gulf State Park Pier Renovation

Project Summary/Background. Located in Gulf Shores, Alabama, and owned by the State of Alabama, the Gulf State Park Pier opened to the public in July 2009 after the original pier was destroyed in 2004 by Hurricane Ivan. The 20-foot wide, 1,540-foot-long pier sits 20 feet above mean sea level. It stretches 22,670± square feet over the water and provides 2,448 feet of fishing space (Figure 2-4). The Gulf State Park Pier also includes a concession area and indoor retail shop. This project would provide funding to renovate the Gulf State Park Pier. The original decking is now nearly 10 years old and is showing considerable wear. The wood decking was the correct choice at the time, but the ADCNR, State Parks Division, now recognizes that alternative materials would likely have a longer life expectancy and provide a more "customer friendly" surface than what currently exists. This project would replace the entire pier deck with materials that have greater longevity. The new decking would be removable in the event of a hurricane. The material for the pier would be evaluated and selected with a focus on its projected life span under harsh marine conditions. Previously, the pier was constructed of treated southern pine, but the decking deteriorated in less than a decade. Using a material with a longer life span should reduce maintenance and extend the need for replacement by several decades. In addition to the replacement of the decking panels, this project also proposes to enhance the existing lighting at the pier and in the parking lot and replace the weathered pine handrails. The improved lighting would feature narrow spectrum amber LEDs combined with special shielding, making it a wildlife-friendly lighting solution. Light poles at the pier would also be replaced.

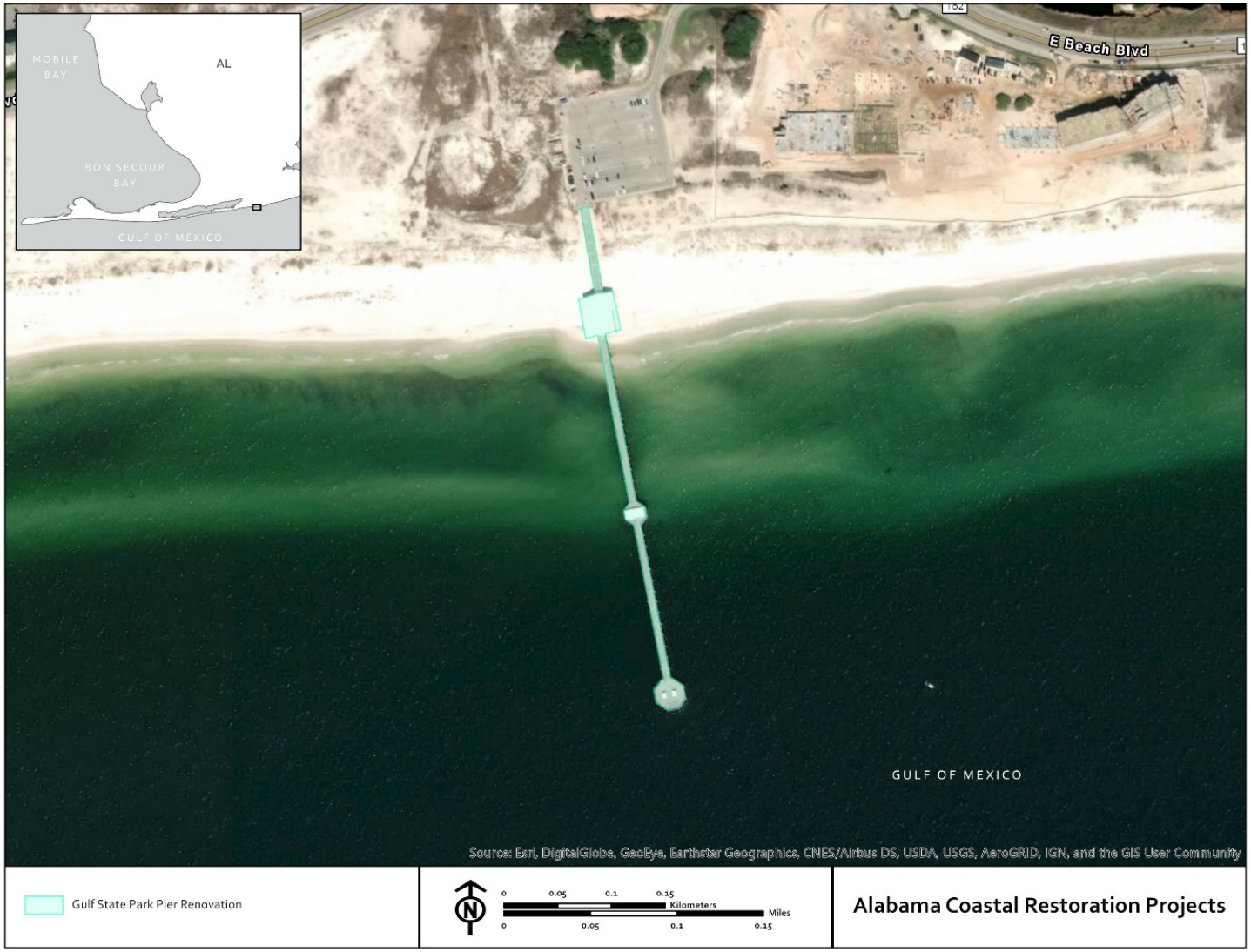

Figure 2-4: Location of the Gulf State Park Pier Renovation

The alternative also proposes replacing the existing fish cleaning station. Many anglers regularly use this station to clean their catch, thus the carcasses of the cleaned fish are typically tossed into the Gulf and are quickly eaten by predator fish and/or sink to the bottom. The "chumming" of this area attracts sharks that have become a nuisance for many anglers because their bait is eaten by sharks or sharks eat the catch as the angler reels it in. Pelicans flocking to the cleaning station have also become a nuisance for anglers and sightseers. The proposed solution would be to replace the fish cleaning station with one that includes a Hydro Shredder-Grinder suitable for handling pier-caught fish carcasses. The discharge would be disposed through a nearby existing sewer line. Equipment would include a marine-grade, stainless steel cleaning table with water hoses and a powered grinder with safety enclosures and lockout doors to prevent regular access to unit. Water, power, and sanitary sewer utilities would be required and are available nearby for connection. The station would include two ADA-compliant cutting table surfaces.

Gulf State Park features 6,500 acres of protected lands and the park has several recreational opportunities, including 2.5 miles of beach, three freshwater lakes, a scenic nature trail, beach pavilion, fishing pier, picnic area, campground, cabins and cottages, and a gulf-front lodge and conference center. Twenty-seven miles of paved/enhanced trails wind through the park and the 496-site campground has improved and primitive sites. Renovations of the pier would further enhance access and enjoyment of the park for visitors.

Proposed Infrastructure/Improvements. Proposed improvement would include demolishing and removing existing panels, installing new panels and handrails, installing wildlife friendly lighting, replacing existing parking lot lighting with wildlife-friendly lighting, and replacing the fish cleaning station.

Construction Methodology (or Implementation Methodology) and Timing. Project planning would take between 4 and 6 months to complete. Construction of the panels would occur at an off-site facility and would require up to 3 months to complete. Installation of the panels is projected to take up to an additional 3 months. Complete project planning and installation is expected within 18 months.

The new decking would be fabricated off site and delivered to Gulf State Park for installation. The removal and installation process would occur using small equipment and manual labor. Any construction, installation, or material staging would occur on the existing pier or in the parking area. The material for the pier would be evaluated and selected with a focus on the projected life span of the material under harsh marine conditions. The decking would be spaced at a half inch or less, as required by code. Construction and assembly of the new fish cleaning station would occur at an off-site manufacturing facility.

BMPs would be implemented to avoid or minimize impacts from the proposed project. Construction/installation activities would take place only on the existing Gulf State Park Pier or in the parking area. No additional piles or structures would be constructed in adjacent waters. No water-born vessels would be used for the project, and all construction vehicles, material storage, and/or similar activities would be restricted to the existing parking area at the pier. The planning, selection, and installation of new lighting fixtures and bulbs would follow up-to-date industry standards for wildlife-friendly approaches and would be submitted for USFWS review/approval prior to purchase and installation to ensure lighting plan is consistent with USFWS wildlife-friendly guidance.

Operation and Maintenance Requirements. ADCNR maintains and operates the Gulf State Park Pier and would provide ongoing maintenance of the pier, as needed, using collected user fees.

Project Monitoring Summary. The project would be monitored one time upon completion of construction to ensure that the project was constructed as designed. A visitor use count would occur once at the end of the first year.

Costs. The estimated project cost is $2,447,021 and would include funds for planning and design, construction, monitoring, and Trustee oversight. ADCNR would prepare construction documents and specifications for the panels, handrails, and cleaning station and would advertise the project in accordance with applicable procurement regulations. ADCNR would prepare construction documents and specifications in coordination with USDOI at specific, agreed-upon milestones for the lighting portion of the project and would advertise the project in accordance with applicable procurement regulations. Coordination with ADNCR and USDOI is addressed in more detail in the project MAM plan.

2.6.5 Perdido Beach Public Access Coastal Protection

Project Summary/Background. This proposed project would fund permitting, design, and construction of shoreline protection breakwaters at two areas of public access to the water in Perdido Beach, Alabama (at Mobile Avenue and Escambia Avenue). Coastal storms and surges and residential hardening of the seawall adjacent to the public access points have resulted in the loss of a large amount of sand at the public access areas, leaving little to no beach for the public to enjoy. Seawalls are located on either side of the beach access. Hardened seawalls tend to cause scouring to the adjacent properties, and the two public access properties have been eroding over time (see Figure 2-5).

While the portion of the beach above the mean high-water mark is privately owned, the entire beach area is included in a public easement, and the public has been accessing this site for beach use for nearly 20 years. The public has a right to use and access any of the privately owned areas within the easement. This project would install two shoreline protection projects.

Once breakwaters are in place, sand would be hauled in to stabilize and renourish beach areas, and native vegetative planting would be added to further stabilize the shoreline. The State of Alabama would own the renourished beach area, and appropriate documentation confirming this ownership and easement use would be obtained prior to beginning work on this project. This area of Perdido Beach is one of the few areas that does not contain a seawall, and the sand would allow natural drainage and percolation. Vegetation would be planted in strategic areas to provide a buffer and to prevent scouring. This wetland would consist of vegetation that would also act as a nursery for fish and provide educational opportunities for the public. In addition to recreational use benefits, the project is expected to provide a number of additional benefits, including shoreline protection, coastal and terrestrial habitat restoration, and benefits to aquatic nursery habitat. ADCNR would serve as the implementing Trustee for this project.

Proposed Infrastructure/Improvements. Improvements at the Mobile Avenue public access beach area would consist of 309 linear feet of riprap. Thirteen 20-foot sections with 5-foot gaps and a small breakwater in front of each gap would be installed with 3-foot spacing and native wetland vegetation would be planted.

The second project site would be Escambia Avenue. Improvements at the Escambia Avenue public access beach area would consist of 302 linear feet of staggered riprap. Native wetland vegetation would be planted directly in front of the breakwater, and an estimated 1,005 cubic yards of sand would be trucked to renourish the beach. Vegetation plantings would be strategically located to help stabilize the shoreline.

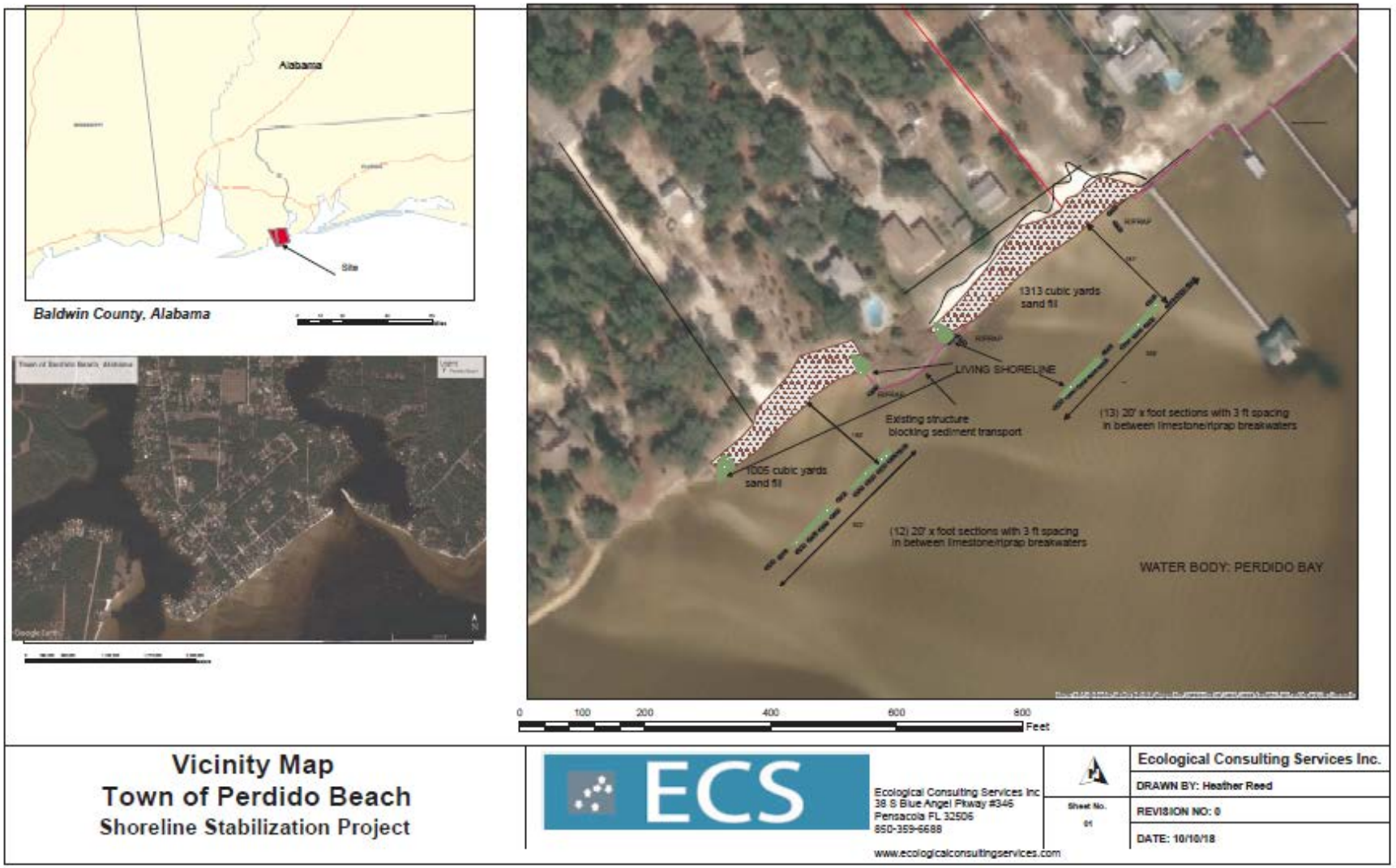

Figure 2-5: Project Location

Construction Methodology (or Implementation Methodology) and Timing. All work would be completed by water access except for planting and sand nourishment, which would be delivered by truck. For the sand nourishment process, dump trucks would bring the sand on existing roadways. Once at the end of the existing roadway, the sand would be deposited over the eroded areas. An excavator would take the sand and spread it to create the new beach areas. During this operation, excavator operations would occur only on the new sand, for the duration of time needed to spread the sand, and would not operate on areas where the existing beach has not eroded. The limestone rock for the breakwaters would be transported by barge.

The Town of Perdido Beach had a pre-application meeting with the U.S. Army Corps of Engineers (USACE) regarding the project. USACE requested that hydrographic modeling be completed. Modeling is included in the project budget, and the project design may change based on its results. Hydrographic modeling would include the following parameters: littoral drift, yearly winds, fetch, and recent storms. The hydrographic model would be designed by a coastal engineer (Professional Engineer) to verify the breakwater and beach pocket design or recommend a different design. A summary report would be provided with the model results. The coastal engineer would sign off on the coastal design. Permitting is expected to take approximately 3 to 6 months. E&D is expected to take 4 to 5 months, and construction would take 4 to 5 months, for a total project duration of 11 to 16 months.

Operation and Maintenance Requirements. The Town of Perdido Beach would maintain the project. Maintenance would include replanting in the event a storm or another event that prevents establishment of vegetation and requires replanting.

Project Monitoring Summary. The project would be monitored to ensure that baseline surveying and visitor use surveys were conducted, ensure that construction was completed as designed, and determine vegetation percent survival. Appendix E presents the detailed MAM plan.

Costs. The estimated project cost is $333,300 and would include funds for planning and design, construction, monitoring, and Trustee oversight. Contractors would be competitively procured in accordance with applicable local and state guidelines.

2.6.6 BSNWR Recreation Enhancement – Mobile Street Boardwalk

Project Summary/Background. USFWS manages more than 7,500 acres of land as part of BSNWR for migratory birds, endangered species, and public recreation (see Figure 2-6). Most of the refuge is located along the Fort Morgan Peninsula and provides the public with more than 7 miles of trails, two beach access locations, and a kayak launch into Little Lagoon. Within the last few years, local areas (i.e., Orange Beach and Gulf Shores) and the refuge have experienced a large increase in visitation. Enhancing BSNWR infrastructure and public access points would increase recreational opportunities for visitors. As a result of growing visitation to the refuge and harsh coastal environment, BSNWR recreational infrastructure needs to be replaced or enhanced to support desired public use. This project would replace or repair public boardwalks and trailhead parking lots at the BSNWR and enhance directional and informational signage to facilitate public use, consistent with the BSNWR's Comprehensive Conservation Plan and visitor use objectives.

Proposed Infrastructure/Improvements. The Mobile Street boardwalk and parking lot, a much-loved local beach access point, typically hosts 57,000 annual visitors. This heavy use and several hurricanes over the years have degraded this infrastructure. USFWS has completed numerous repairs to keep the boardwalk open. However, with declining BSNWR staff and the dunes starting to reclaim that area, it has become more difficult to maintain a safe, accessible boardwalk. USFWS has been able to maintain the site to allow the boardwalk to remain open; however, continued degradation could lead to closure.

Figure 2-6: Location of the Bon Secour National Wildlife Refuge

The current boardwalk would be replaced with a recycled composite board material that has a longer life span than wood in harsh coastal environments and would be easier to maintain. Access and erosion issues in the nearby public parking lot would also be addressed. The replacement boardwalk would be 6 feet wide and approximately 500 feet long. A larger platform toward the north end would facilitate ADA-compliant access. The boardwalk's height would be variable, most likely between 0 to 10 feet above the ground surface, would be designed to meet ADA criteria, and would allow for clearance of the existing dune system. Final heights would be guided by engineering surveys. Two benches, serving as resting places for visitors and persons with limited mobility, would be installed along the boardwalk to meet ADA compliance requirements. A kiosk and one way-finding sign would be installed in the parking lot, and other wayfinding signs would be installed along Mobile Street and Highway 180 to facilitate visitor access. The parking lot is approximately 10,004 square feet with room for approximately 30 parked cars. The parking lot currently retains water after rain events, has potholes, and is degraded by erosion, limiting access and affecting adjacent habitat. To mitigate this issue, proper drainage would be installed, the surface would be leveled, and gravel would be added. It is anticipated that this project would continue to support visitation at historical levels, while also attracting an additional 7,000 annual visitors. USDOI would serve as the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. Construction would include deconstruction/demolition of existing boardwalks/parking lots and construction of a new boardwalk and parking lots with a construction duration of approximately 1 to 3 months. Construction on the Mobile Street boardwalk and parking lot is expected take place from October through April.

Operation and Maintenance Requirements. USDOI would operate and maintain the project.

Project Monitoring Summary. The project would be monitored one time upon construction to ensure that amenities are constructed as designed. The project would be monitored for visitor use four times during the months of May to October. Monitoring would occur annually for three years after construction is complete. A full MAM plan is located in Appendix E.

Costs. The estimated project cost is $1,189,899 would include funds for planning and design, construction, monitoring, operations and maintenance, and Trustee oversight.

2.6.7 BSNWR Recreation Enhancement – Centennial Trail Boardwalk

Project Summary/Background. This project would occur at BSNWR, and the project background would be the same as described above in Section 2.6.6 (see Figure 2-6). This project would replace or repair public boardwalks at the BSNWR and enhance directional and informational signage to facilitate public use consistent with the BSNWR's Comprehensive Conservation Plan and visitor use objectives.

Proposed Infrastructure/Improvements. The Centennial Trail boardwalk is a primary attraction for visitors to the area, historically hosting approximately 7,000 annual visitors. In addition to being an attraction, the trail connects other popular trails on the refuge. However, because of safety concerns caused by dilapidated trails, the Centennial Trail boardwalk is currently closed. The wooden boardwalks along this trail have degraded over the years and have succumbed to rot and rust. The wooden boardwalks along the Centennial Trail would be replaced with composite material, which has a longer life span than wood in harsh coastal environments and would be easier to maintain by BSNWR staff and volunteers. USDOI would serve as the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. Construction would include deconstruction/demolition of existing boardwalks and construction of a new boardwalk with a construction duration of approximately 1 to 3 months. Construction on the Centennial Trail boardwalk can occur during any point of the year because construction would not affect nesting endangered species.

Operation and Maintenance Requirements. USDOI would operate and maintain the project.

Project Monitoring Summary. The project would be monitored one time upon construction of project to ensure that amenities are constructed as designed. The project would be monitored for visitor use four times during the months of May to October. Monitoring would occur annually for three years after construction is complete.

Costs. The estimated project cost is $1,711,771 and would include funds for planning and design, construction, monitoring, operations and maintenance, and Trustee oversight.

2.7 BIRDS

Project screening in the Birds Restoration Type identified three projects for inclusion in the reasonable range of alternatives. The no action alternative was also evaluated pursuant to the requirements of NEPA. Table 1-2 presents the three projects and their anticipated costs.

2.7.1 Stewardship of Coastal Alabama Beach Nesting Bird Habitat

Project Summary/Background. The Gulf Coast region supports a diversity of coastal bird species throughout the year—as nesting grounds during the summer, as a stopover for migrating species in the spring and fall, and as winter foraging and sheltering habitat for numerous species that breed elsewhere.

The DWH NRDA Trustees documented large-scale, pervasive injury to at least 93 species of birds across the Gulf of Mexico that included both resident and migratory species (DWH Trustees, 2017). The Trustees have previously funded several bird restoration activities in the State of Alabama, some of which are complete and some of which will commence in the coming months. These projects include:

- **Enhanced Management of Avian Breeding Habitat.** The DWH NRDA Early Restoration Phase II Enhanced Management of Avian Breeding Habitat Injured by Response in the Florida Panhandle, Alabama, and Mississippi project helped to restore bird species injured by the DWH oil spill by reducing disturbance to beach nesting bird habitat in targeted project areas.
- **Osprey Restoration in Coastal Alabama.** This project in the Final Phase IV ERP/EAs established five osprey nesting platforms along the coast in Mobile and Baldwin counties to provide enhanced nesting opportunities for fish-eating raptors, including osprey.
- **Colonial Nesting Wading Bird Tracking and Habitat Assessment—Two Species.** This AL TIG Restoration Plan II project would include a telemetry tracking study of the movement of two bird species breeding along the Alabama coast—tricolored heron and either little blue heron or white ibis.
- **Southwestern Coffee Island Habitat Restoration Phase I (E&D Only).** This AL TIG Restoration Plan II project will fund planning activities related to the restoration and creation of colonial nesting bird breeding habitat and tidal wetlands along the southwestern shoreline of Coffee Island, located in Mississippi Sound in south Mobile County, Alabama.

Additionally, the State of Alabama funded the Alabama Coastal Bird Stewardship Program via funding from the NFWF GEBF. The program works to improve the status of bird species of conservation concern by training volunteers to monitor targeted and other species and their habitat at key nesting sites in the state. This project would expand on this work in coastal Alabama by reducing human disturbance to and predation of nests and chicks of coastal nesting bird species injured by the DWH oil spill, thereby potentially increasing productivity of those species. These techniques have been identified by the DWH Trustees in the Strategic Framework for Bird Restoration Activities (DWH Trustees, 2017). This proposed 3-year project would complement the work of similar initiatives in the Gulf of Mexico in Florida,

Mississippi, Louisiana, and Texas. ADCNR would be the implementing Trustee; USDOI would be a collaborating agency.

Proposed Infrastructure/Improvements. The program would consist of five components that would work together to reduce stressors that affect coastal bird populations and to provide information in support of future restoration decision-making. Specific activities and target locations may vary from year to year based on several factors including, but not limited to: where nesting occurs, where evidence of stressors is detected, what management activities are most successful at each area, and where project implementers are able to gain access (some nesting areas may be located on private property and would require authorization from landowners to access). Table 2-1 presents the proposed initial target project areas and restoration actions. The sites in Table 2-1 have been identified as areas of importance at which to focus monitoring and/or stewardship. This list of areas is not meant to be a definitive or prescriptive for future monitoring and stewardship activities. Prior to the second year's nesting season, project implementers would consult with ADCNR and USDOI to identify target sites and actions based on previous data, lessons learned, and other information. Reporting requirements to facilitate this coordination are further discussed in the MAM plan (Appendix E). This plan would include other potential geographic focus areas and restoration activities based on previously collected data.

1. **Conduct stewardship activities to reduce human disturbances that contribute to nest failure.** Human disturbance is of particular concern for beach nesting birds in coastal Alabama because of the popularity of Alabama's beaches for recreational activities. This disturbance often leads to seasonal nest or colony abandonment in local areas, resulting in egg loss and chick mortality. Reducing anthropogenic disturbance at important nesting areas can support success (Burger et al., 2004; DWH Trustees, 2017 Larson et al., 2016; McGowan and Simons, 2006; Molina and Erwin, 2006; Pruner et al., 2011). A primary element of the proposed program would involve reducing human disturbance in target nesting areas to improve local productivity. Species that would benefit from this project include the least tern (*Sternula antillarum*), black skimmer (*Rynchops niger*), snowy plover (*Charadrius nivosus*), and Wilson's plover (*Charadrius wilsonia*). Project implementers would install symbolic (temporary post and rope) and/or exclusionary fencing around nesting areas prior to the start of the nesting season to reduce human ingress and disturbance. While on site, implementers may also work to educate and guide beachgoers away from sensitive nesting areas. Implementers could also engage the public by providing opportunities to observe birds from a safe distance using viewing scopes into nesting areas for the public to observe adults incubating eggs and/or feeding small, flightless chicks from a safe distance. These activities would serve to encourage protective behavior by the public, further reducing disturbance.
2. **Conduct targeted, coordinated predator management activities.** Site-specific predator management strategies can help increase bird productivity where predators are among the primary causes of nest or fledgling mortality (Greer et al., 1988; Saalfield et al., 2011). The City of Orange Beach, for example, is currently implementing a predator management strategy on islands in Perdido Bay focused on the management of red fox and coyote, and BSNWR is planning coyote removal from targeted units at strategic times to facilitate beach nesting bird production. This project would coordinate with these activities to help refine beach nesting bird predator management activities. Funding would support continued predator management efforts at BSNWR and in the City of Orange Beach and begin predator management activities on Dauphin Island and/or other sites where needed. Predator management strategies (i.e., target species, method of removal) on Dauphin Island are subject to the recommendation of USDA predator management professionals, following their evaluation of the methods needed for the area.
3. **Conduct monitoring in support of adaptive management at project sites to determine nesting and fledging success.** Monitoring critical nesting sites, assessing nest success, and determining breeding

densities provides insight into the status of Alabama breeding populations for the above-referenced species, all of which are listed as Alabama Species of Conservation Concern (ADCNR, 2015). Nesting activity, nest success, brood success, and predator activity would be monitored following Pruner et al. (2011) or another appropriate method that facilitates consistent data collection across similar projects in the Gulf region. In addition to bird numbers and breeding productivity, monitoring would also quantify and assess the number of acres treated with fencing, education, predator reduction; quantify and assess habitat quality, degree of predator activity, extent of human disturbance, and number of people reached with outreach and education activities. These data would help inform Trustees' understanding of coastal ecosystem health and the extent of human-induced threats, as well as from natural disturbances such as hurricanes, flooding, or storm surge. In addition, special attention would be given to the proximity of nests, eggs, chicks, and adults outside posted project areas. Project implementers would coordinate routinely to discuss adaptive management of posted areas (e.g., shifting or expanding a posted area).

4. **Deploy decoys.** Species-specific decoys would be deployed to attract target bird species to suitable nesting areas (e.g., lower risk of human disturbance or predation in areas that contain natural cover and forage access for adults and chicks). In some cases, species are nesting in areas of high human traffic or predation, which increases the likelihood of nest failure. Deploying decoys to areas that are not currently used for nesting but are deemed suitable habitat would potentially encourage target species to use habitat that experiences reduced stressors associated with nest or fledgling mortality. Decisions regarding specific deployment locations would be made in coordination with ADCNR and USDOI experts prior to implementation.

5. **Conduct habitat and nesting area enhancements.** The City of Orange Beach actively manages a number of islands in the Perdido area for bird species, including least tern, black skimmer, and great blue heron. The project would increase the size of a current least tern nesting area by removing vegetation and installing/distributing shell hash. Vegetation plantings are also proposed and would include a variety of native trees and shrubs and coastal dune grasses on Robinson and Walker Islands. The project would also repair/replace signage and perch posts as needed in submerged aquatic vegetation beds to deter boat traffic in areas that serve as foraging habitat for birds.

Collaboration with local project partners would result in significant additional expertise and cost savings to the project. The City of Orange Beach would provide staff time and materials to preserve and enhance bird nesting opportunities on the Lower Perdido Islands, coordinate staff and volunteer work days, and provide city resources such as tools, equipment, vehicles, and vessels. ADCNR would serve as the implementing Trustee for this project.

Table 2-1: Potential Project Areas, Activities, and Species

Potential Area	Potential Activities	Potential Species
Tern Island	Erect symbolic fencing and active stewardship to reduce human disturbance	Least tern, black skimmer
Pelican Island	Erect exclusionary fencing and provide active stewardship to reduce human and predatory disturbance; predator management	Least tern, black skimmer,[b] Wilson's plover[b]
Marsh Island	Install signs; provide stewardship and monitoring to limit human disturbance of the island during nesting season	Black skimmer

Potential Area	Potential Activities	Potential Species
Coffee Island	Install signs; provide stewardship and monitoring patrols to limit human disturbance of the southwest portion of the island during nesting season	American oystercatcher, least tern, reddish egret, black skimmer[b]
Cat Island[a]	Install signs; provide stewardship and monitoring to limit human disturbance of the island during nesting season	American oystercatcher, least tern, reddish egret,[b] brown pelican[b]
Alabama Point	Erect signage, symbolic and/or exclusionary fencing and provide active stewardship. These actions would reduce human and predatory disturbance.	Least tern, black skimmer[b]
BSNWR	Erect signage, symbolic fencing and provide active stewardship to reduce human disturbance; predator management	Snowy plover, least tern,[b] Wilson's plover[b]
Gulf State Park	Erect symbolic and/or exclusionary fencing and provide active stewardship. These actions would reduce human and predator disturbance	Snowy plover, least tern, black skimmer [b]
Dauphin Island West End[a]	Erect symbolic fencing and/or exclusionary fencing and provide active stewardship to reduce human disturbance; predator management	Snowy plover, least tern, reddish egret, Wilson's plover[b]
Lower Perdido Islands	Erect signs and/or symbolic and/or exclusionary fencing; provide active stewardship to reduce human and predator disturbance; and install shell hash and/or plantings to encourage nesting.	Least tern, black skimmer, great blue heron

[a] This property is currently under private ownership and would require consent and cooperation from the landowner for access. In the event that appropriate access cannot be obtained for this property, these activities would be redirected to another appropriate location if possible.

[b] Birds listed as "potential" have historically nested in these areas but predation and/or anthropogenic disturbances have caused them to abandon the area as nest sites. With active stewardship and predator management these species could potentially return.

Construction Methodology (or Implementation) and Timing. This project would not include construction elements. Stewardship and monitoring activities, including deployment of decoys, would be performed by a third-party contractor, which would be procured according to State of Alabama procurement laws and procedures. This would be a 3-year contract.

Operation and Maintenance Requirements. Operation and maintenance activities would be required for this project. A supply of posting materials would need to be maintained. Fencing is subject to disturbance by storms and people, and the need to re-post some areas is anticipated

Project Monitoring Summary. See attached project MAM plan in Appendix E. In general, project nesting sites would be monitored to support adaptive management practices/responses (e.g., if birds shift nesting site locations, posting materials would be relocated accordingly) and to gather the data needed to quantitatively evaluate the effectiveness of the management actions.

Costs. The estimated project cost is $2,018,047 and would include funds for management and/or restoration activities and monitoring.

2.7.2 Stewardship of Coastal Alabama Beach Nesting Bird Habitat—Stewardship and Monitoring Only

Project Summary/Background. The background information is the same as described above in Section 2.7.1, for the Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative. The program would comprise two components that work together to reduce human stressors that affect coastal bird populations and to provide information to support future restoration decision-making. Specific activities and target locations may vary from year to year based on a number of factors including, but not limited to: where nesting occurs, what management activities are most successful at each area, and where project implementers are able to gain access (some nesting areas may be located on private property and require authorization from landowners to access). Table 2-1 in Section 2.7.1 lists the initial target project areas and restoration actions. Prior to the second year's nesting season, project implementers would consult with ADCNR and USDOI to identify target sites and actions based on previous data, lessons learned, and other information. Reporting requirements to facilitate this coordination would be the same as those discussed in the MAM plan for the Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative (Appendix E).

Proposed Infrastructure/Improvements. This plan would include other potential geographic focus areas and restoration activities based on previously collected data.

1. **Conduct stewardship activities to reduce human disturbances that contribute to nest failure.** Human disturbance is of particular concern for beach nesting birds in coastal Alabama because of the popularity of Alabama's beaches for recreational activities. This disturbance often leads to seasonal nest or colony abandonment in local areas, resulting in egg loss and chick mortality. Reducing anthropogenic disturbance at important nesting areas effectively reduces human disturbance of nesting sites (Burger et al., 2004; DWH Trustees, 2017; Larson et al., 2016; McGowan and Simons, 2006; Molina and Erwin, 2006; Pruner et al., 2011). A primary element of the proposed program would involve reducing human disturbance in target nesting areas to improve local productivity. Target species would include the least tern, black skimmer, snowy plover, and Wilson's plover. Project implementers would erect symbolic (temporary post and rope) and/or exclusionary fencing around nesting areas prior to the start of the nesting season to reduce human ingress and disturbance. While on site, implementers would also work to educate and guide beachgoers away from sensitive nesting areas. Implementers could also engage the public by providing opportunities to observe birds from a safe distance using viewing scopes. These activities would educate the public about the importance of adopting bird-friendly behaviors near nesting areas, further reducing disturbance.
2. **Conduct monitoring in support of adaptive management at project sites to determine nesting and fledging success.** Monitoring critical nesting sites, assessing nest success, and determining breeding densities provide insight into the status of Alabama breeding populations for the above-referenced species, all of which are listed as Alabama Species of Conservation Concern. Nesting activity, nest success, brood success, and predator activity would be monitored following Pruner et al. (2011) or another appropriate method that facilitates consistent data collection across similar projects in the Gulf region. In addition to bird numbers and breeding productivity, monitoring would also quantify and assess the number of acres treated with fencing and education and quantify and assess habitat quality, degree of predator activity, extent of human disturbance, and number of people reached with outreach and education activities. These data could help inform the Trustees' understanding of coastal ecosystem health and the extent of human-induced threats. In addition, special attention would be given to the proximity of nests, eggs, chicks, and adults outside posted project areas. Project implementers would coordinate routinely to discuss adaptive management of posted areas (e.g., shifting or expanding a posted area).

Collaboration with local project partners would result in significant additional expertise and cost savings for the project. ADCNR would serve as the implementing Trustee for this project.

Construction Methodology (or Implementation) and Timing. Information related to construction methodology and timing is the same as described above in Section 2.7.1.

Operation and Maintenance Requirements. Information related to operation and maintenance activities is the same as described above in Section 2.7.1.

Project Monitoring Summary. In general, project nesting sites would be monitored to support adaptive management practices/responses (e.g., if birds shift nesting site locations, posting materials would be relocated accordingly) and to gather the data needed to quantitatively evaluate the effectiveness of the management actions.

Costs. The estimated project cost is $1,895,597 and would include funds for management and/or restoration activities and monitoring.

2.7.3 Dauphin Island West End Acquisition

Project Summary/Background. This project would entail acquiring approximately 838 acres of privately-owned beach/dune habitat at the west end of Dauphin Island (see Figure 2-7), developing a management plan, and implementing initial management actions based on recommendations in the management plan. The western end of Dauphin Island encompasses a diversity of coastal habitats—sweeping dunes, salt marsh, and beach flats. Sea turtles and several bird species, including the federally listed piping plover (*Charadrius melodus*), use these habitats. The beach and dune areas serve as nesting habitat for the least tern and the snowy plover. Initial unpublished 2018 data from the Birmingham Audubon Society's Alabama Coastal Bird Stewardship Program and other bird surveys from the previous decade indicate that this property also provides foraging habitat for Wilson's plover, snowy plover, reddish egret (*Egretta rufescens*), American oystercatcher (*Haematopus palliates*), least tern, and other coastal bird species (Zdrakovic 2007, 2012). Public ownership of this large parcel would facilitate the protection and management of its habitats for the benefit of bird species injured by the DWH oil spill.

The Trustees propose acquiring the property from a willing seller and have obtained a Yellowbook Appraisal for the property, valued at $5,000,000. The acquisition would include an appropriate land protection instrument (i.e., deed restriction or conservation easement) to ensure that the purpose of restoration, as described in this plan, is maintained in perpetuity. ADCNR would serve as the implementing Trustee for this project. Due diligence and land acquisition would take approximately 6 months to 1.5 years to complete.

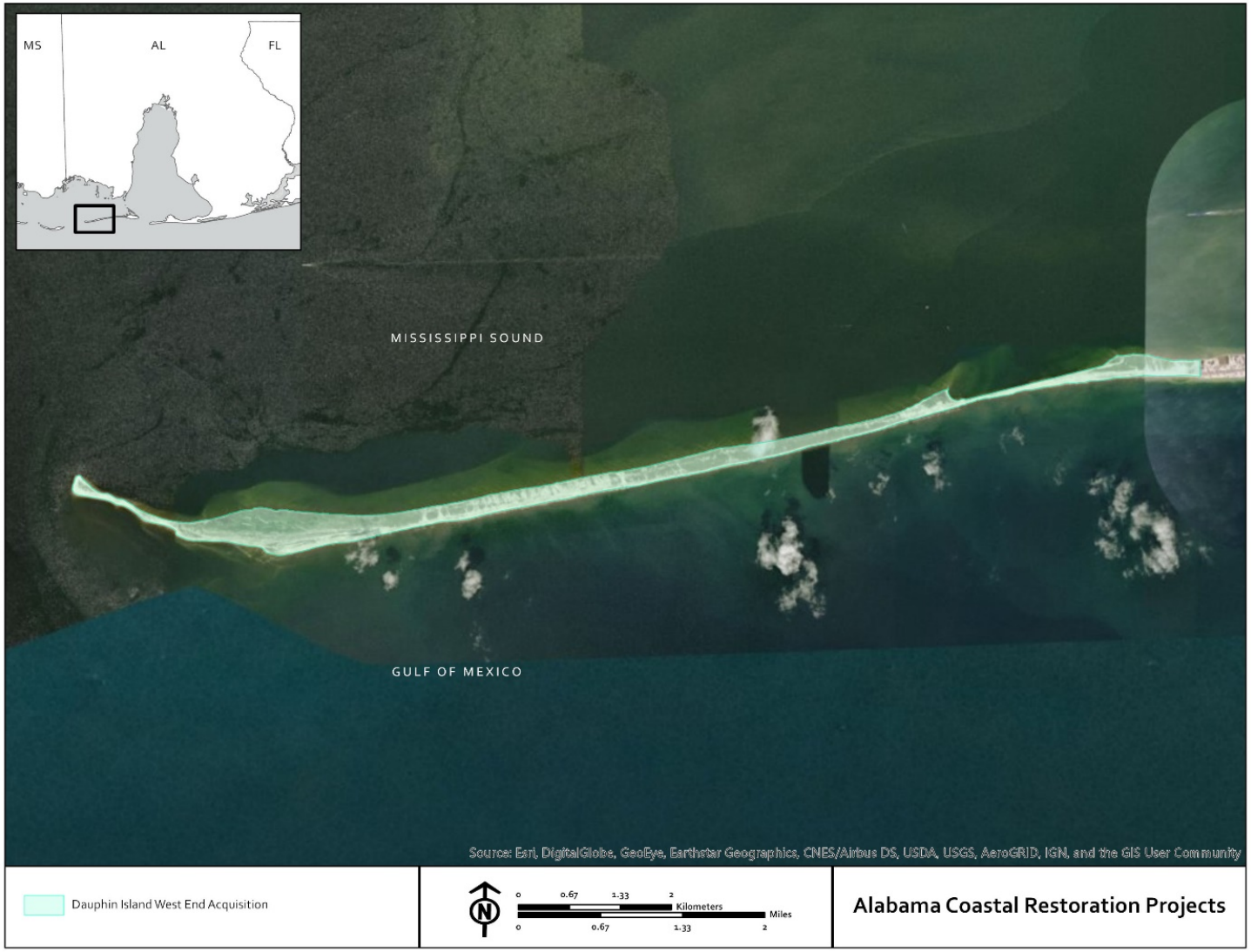

Figure 2-7: Boundary of Proposed Acquisition

During the acquisition process and with the current owner's approval, continued monitoring would occur to collect data on the frequency of bird usage for loafing, nesting, foraging, and breeding on the property as a part of the Stewardship of Coastal Alabama Beach Nesting Bird Habitat Project proposed in this plan (Section 2.7.1). Mobile County and the Town of Dauphin Island would develop a bird conservation and management plan in consultation with ADCNR and other entities. The plan would include a prioritized list of site-specific management actions and potential restoration projects based on an assessment of habitat suitability and quality, bird species and use information, and restoration activities described in the Trustees' Strategic Framework for Bird Restoration Activities (DWH Trustees, 2017), with the goal of increasing nesting bird populations and/or improving habitat quality and availability. Restoration activities that would be considered in the plan include active stewardship and education in conjunction with symbolic or exclusionary fencing, predator control and management, decoy deployment, and habitat and nesting enhancement activities (DWH Trustees, 2017).

Proposed Infrastructure/Improvements. No infrastructure or improvements are proposed at this property. It would be maintained as natural habitat and would serve as a protected area for injured bird species, including the piping plover and least tern. Management activities designed to support productive bird populations could include habitat enhancements, temporary closures, and/or symbolic and/or predator exclusion (non-electric) fencing.

Construction Methodology (or Implementation) and Timing. This project would consist of due diligence and land acquisition to help facilitate continued bird stewardship. Acquisition of this property would be contingent on a finalized contract of sale from the willing seller at or below the appraised value. Due diligence and land acquisition would take approximately 6 months to 1.5 years to complete.

Operation and Maintenance Requirements. The property would be owned by Mobile County and managed by Mobile County and the Town of Dauphin Island. Mobile County and the Town of Dauphin Island agree to hold the property for conservation in perpetuity for the purposes of restoration and stewardship of injured bird species.

Project Monitoring Summary. See attached project MAM plan in Appendix E. In general, the MAM plan would include parameters associated with the acquisition of the parcel and the development of the MAM plan. Once specific management and restoration activities are identified, performance parameters would be developed and the MAM plan would be updated accordingly.

Costs. The estimated project cost is $6,681,250 and would include funds for acquisition, initial management, restoration activities, and monitoring.

2.8 NO ACTION/NATURAL RECOVERY

In accordance with the OPA NRDA regulations, the Final PDARP/PEIS considered a ". . . natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline" (15 CFR 990.53(b)(2)). Under a natural recovery alternative, no additional restoration would be completed by the Trustees to accelerate the recovery of injured natural resources or to compensate for lost services. The Trustees would allow natural recovery processes to occur, potentially resulting in 1 of 4 outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to baseline or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation in the Final PDARP/PEIS. This RP III/EA tiers to the Final PDARP/PEIS and incorporates the analysis of the No Action/Natural Recovery alternative by reference, The AL TIG did not further evaluate natural recovery for the Provide and Enhance

Recreational Opportunities or Birds Restoration Types as a viable alternative under OPA, and natural recovery is not considered further in this Draft RP III/EA.

Because NEPA requires consideration of a no action alternative as a basis for comparison of potential environmental consequences of the action alternatives(s), a no action alternative is evaluated in that sense in this Draft RP III/EA. This analysis presents the conditions that would result if the AL TIG did not select to undertake any additional restoration for injured natural resources or to compensate for lost services at this time. The environmental consequences of such an alternative are evaluated in Chapter 4 for comparison with the remaining action alternatives.

3.0 OPA EVALUATION OF RESTORATION ALTERNATIVES

The Trustees are responsible for identifying a reasonable range of restoration alternatives (15 CFR 990.53(a)(2)) that are to be evaluated according to the OPA standards (15 CFR 990.54). Chapter 2 describes the screening and identification of the proposed reasonable range of alternatives for this Draft RP III/EA. This chapter discusses the OPA evaluation. This evaluation process was informed by the OPA criteria found in 15 CFR 990.54(a) and by additional deliberations on restoration goals and objectives conducted by the AL TIG.

For each alternative, the following six OPA criteria were evaluated independently and a determination was made as to how well the alternative met each individual criterion.[11]

- Trustee goals and objectives[12]
- Cost to carry out the alternative
- Likelihood of success
- Avoidance of collateral injury[13]
- Benefits to more than one natural resource/service
- Effects on public health and safety

3.1 PROVIDE AND ENHANCE RECREATIONAL OPPORTUNITIES PROJECTS

3.1.1 Overview of Restoration Goals and Approaches

For Provide and Enhance Recreational Opportunities projects (also referred to as recreational use projects), the AL TIG developed a reasonable range of alternatives based on the following goals and objectives derived from the Final PDARP/PEIS (Section 5.5.14.1) and state-specific considerations. For recreational use, the Final PDARP/PEIS established two goals for restoration:

- Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.
- Use education and outreach to promote engagement in restoration and stewardship of natural resources, which could include education programs, social media, and print materials.

In the initial screening process, the AL TIG focused primarily on three types of projects identified in the Final PDARP/PEIS that directly contribute to compensating for lost recreational use:

[11] For further details about how the AL TIG applied the OPA criteria, please refer to Appendix F. Appendix F-1 discusses generally how the AL TIG approached the OPA criteria. For recreational use projects, the AL TIG developed an expanded discussion (Appendix F-2) of how it approached the OPA evaluation used to assess the projects in this Draft RP III/EA.

[12] Throughout this chapter, "Trustee goals and objectives" refers to the aggregate set of Trustee restoration objectives. This terminology is intended to encompass the Final PDARP/PEIS goals, considerations derived from the Strategic Frameworks, and goals specifically tailored to the Alabama Restoration Area by the AL TIG.

[13] The OPA criteria also include an evaluation of the extent to which alternatives prevent future injury. None of the alternatives considered in this Draft RP III/EA would prevent future injuries from the incident.

1. Enhance public access to natural resources for recreational use,
2. Enhance recreational experiences, and
3. Promote environmental stewardship, education, and outreach.

In addition, consistent with guidance in the Final PDARP/PEIS, the AL TIG considered projects focused primarily on ecological objectives but that had the potential to yield measurable and important recreational benefits.

For this Draft RP III/EA, the AL TIG considered both recreational projects to address lost shoreline use and lost boating opportunities. Shoreline use refers to recreational activities at locations near beaches and other shoreline areas and includes swimming, sunbathing, surfing, walking, kayaking, and fishing from the shore or shoreline structures (i.e., piers). It also includes fishing at sites that are considered coastal but are not directly on the beach. Specifically excluded from the shoreline use assessment are recreational boating, commercial activities, and DWH oil spill response. Boating includes engaging in recreational boating activities that begin at sites near the Gulf Coast and provide access to salt water. The term "sites" encompasses a wide variety of locations with boat access to coastal waters, including marinas, unimproved launches, and private residences. Excluded from this category are non-recreational boating activities, including commercial fishing, law enforcement/safety, and DWH oil spill response.

For screening purposes, the AL TIG required that in order to have a nexus to the DWH oil spill, shoreline use restoration projects must occur at locations on or near the barrier island and ocean-facing beaches of Dauphin Island, Fort Morgan, Orange Beach, and Gulf Shores. For boating, all projects intended to provide boat access to Alabama's nearshore and coastal waters or that enhance the boating or boat fishing experience at these locations were considered to have a nexus to the DWH oil spill.

The remainder of this section discusses the OPA analyses for the seven recreational use projects advanced to the reasonable range of alternatives, with specific reference to each selection criterion.

3.1.2 Perdido River Land Acquisition (Molpus Tract)

3.1.2.1 Project Summary

For the Perdido River Land Acquisition (Molpus Tract) alternative, ADCNR would (1) acquire and permanently conserve 1,391 acres of coastal habitat, (2) construct appropriate infrastructure to create recreational canoe/kayak access and opportunities on the Perdido River, and (3) conduct ecological restoration at the site. For further project details, see Section 2.6.1.

3.1.2.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.*

This alternative would advance the Trustees' goal of increasing boat access to Alabama's nearshore and coastal waters by creating new infrastructure to support canoeing and kayaking on the Perdido River. The project has a nexus to the DWH oil spill through its location on the Perdido River, from which paddlers have access to the coastal waters injured by the DWH oil spill via the Perdido River Blueway Trail, which connects several boating access points along the Perdido River. This project also builds on the Florida TIG's Perdido River and Bay Paddle Trail project, approved in the Florida TIG Final RP I/EA, which connects five boating access points along Perdido River with boating access points farther south in estuarine portions of Perdido Bay and Heron Bayou. Recreational boaters, the same group injured by the DWH oil spill, would be the beneficiaries of this proposed alternative, which would create

replacement lost boating user-days to compensate for the injury caused by the DWH oil spill. Specifically, the addition of this boating access site farther up the river would provide more opportunities for access to coastal waters to a broader group of individuals that may not have previously had boating access to coastal waters. The project would also meet the PDARP goal of increasing recreational opportunities in combination with ecological restoration through the proposed land management and restoration improvements at the site.

Description of Benefits. This alternative would create recreational boating opportunities through site acquisition and the subsequent development of parking and canoe/kayak launch infrastructure on the Perdido River. Consistent with the types of camping opportunities developed along the Perdido River Blueway Trail, the facilities constructed would be very basic, emphasizing the natural aspects of the site. Visitors are expected to be a combination of day-trippers and overnight campers staying at other sites along the river. Because of the isolated location of the property, users would need to drive to the parking area and leave their vehicles after launching their boats. The recreational infrastructure is expected to serve the public for at least several decades and ADCNR would maintain the infrastructure during that time. For longer-term restoration goals, ADCNR intends to return the ecosystem to ecologically valuable native longleaf pine habitat, which would further enhance the visitor experience and the ecological value at the property.

Scale of Benefits. The proposed acquisition is currently in private ownership. As a result, and because few other nearby boating access points are available on the Perdido River in Alabama, this project is expected to generate new boating user-days. The scale of the recreational benefits can be roughly characterized as a function of the availability of parking at the site and the anticipated capacity use of the new facilities. Ten to 15 parking spaces would be available at the project site on a year-round basis. Assuming a utilization rate of around 35 percent, the alternative would generate between 5,000 and 7,500 boating user-days each year.[14]

Public Access. The recreational benefits of this alternative would be broadly available to the public. ADCNR has no plans to charge a fee for use of the site. However, because public transportation in the area is lacking, the benefits of the project would likely accrue primarily to individuals who own vehicles and have sufficient disposable income to own or rent a boat and drive to the site. During peak demand, parking capacity could limit the total public benefits. The project is not expected to cause overcrowding on the river because access would be limited by the relatively small number of parking spaces.

Location. A limited number of boat launch sites are available along the Perdido River in the area of Alabama where this alternative would be located, implying a high value for the incremental recreational benefits attributable to this project. The location of the property is within a 1-hour drive of Mobile and would be available to a large potential visitor population. In addition, the type of recreational camping experience provided by the Perdido River Blueway Trail is relatively unique in coastal Alabama, also adding to the value of this alternative.

Other Benefit Considerations: Acquisition and conservation of the property would provide valuable ecological connectivity benefits, which would help to ensure that the extensive on-site wetlands system continues to support a wide array of ecological functions and services in perpetuity, such as valuable habitat for fish and wildlife species. The project would also contribute to the Trustees' goal of

[14] This reflects the 35 percent utilization rate with cars in the lot turning over twice daily and an average of two occupants per car.

implementing initiatives that restore habitats in appropriate combinations for a given geographic area through consideration of connectivity, size, and distance between projects. In this case, the project would become part of a broader interstate effort involving DWH restoration activities that are designed to restore and conserve the lower Perdido River Watershed in both Alabama and Florida.[15] This broader effort would support the development of a model for the use of DWH funds to foster interstate cooperation on integrated ecosystem planning and restoration.

3.1.2.3 Cost to Carry Out the Alternative

The proposed cost for the Perdido River Land Acquisition (Molpus Tract) Project is $4,742,540. These funds are solely directed to acquiring the land, constructing recreational infrastructure, and conducting appropriate planning and restoration activities on the property. The budget for the alternative includes funds for land acquisition, planning, infrastructure design and construction, ecological restoration, maintenance, monitoring, project oversight and supervision, and contingency. The land acquisition costs included in the budget are based on an estimate and are consistent with previous conservation purchases in the area. A Yellow Book appraisal would be completed prior to land acquisition. The infrastructure development, restoration, monitoring, project oversight and supervision, and contingency costs were estimated by ADCNR staff and reflect the agency's past experience. Based on similar previous projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.1.2.4 Likelihood of Success

The alternative's goal of enhancing recreational boating opportunities while protecting, conserving, and initiating the restoration of the Perdido River property has a high likelihood of success. The land has a willing seller, and it is anticipated that negotiations could lead to its acquisition at a reasonable price. Land acquisitions of this type are a proven approach for achieving the types of conservation goals identified by the AL TIG for this property. ADNCR has implemented similar canoe and kayak infrastructure projects in the past. The fact that this one connects to the more extensive Perdido River Blueway Trail further increases the likelihood of attracting canoeists and kayakers to the area. The proposed restoration techniques (e.g., clearing, thinning, and conducting prescribed burns and hydrologic restoration) have been successfully implemented for recreating longleaf pine habitat capable of supporting a more diverse range of native flora and fauna. Finally, ADCNR, which would hold title to the property, manage the restoration, and provide future maintenance, already successfully manages numerous other properties similar to this one, including the Perdido WMA into which this tract is proposed to be merged.

3.1.2.5 Avoids Collateral Injury

Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this Draft RP III/EA.

3.1.2.6 Benefits More Than One Natural Resource or Service

The primary NRDA benefits of this alternative would be to provide and enhance recreational boating access and use. As noted above, however, site restoration activities would also provide valuable ecosystem connectivity and on-site habitat improvement benefits. Habitat preservation and restoration may also contribute to the maintenance of water quality in the Perdido River Watershed.

[15] See Florida TIG, Final Restoration Plan 1 and Environmental Assessment, March 15, 2019, for projects targeting the Perdido River Watershed.

3.1.2.7 Effects on Public Health and Safety

The Perdido River Land Acquisition (Molpus Tract) alternative is not expected to adversely affect public health and safety. Preservation of the property and restoration of longleaf pine savannas would not involve measures that with adverse impacts on public health or safety. The proposed recreational boating activities themselves also are not expected to result in any elevated risks.

3.1.2.8 Summary OPA Evaluation: Perdido River Land Acquisition (Molpus Tract)

The OPA evaluation indicates that implementation of this alternative would advance the Trustees' goal of increasing recreational boating opportunities through the development of infrastructure that creates canoe and kayak access to Alabama and Florida waters injured by the DWH oil spill. In addition, the project would permanently conserve valuable wetland habitat and begin the process of its restoration and long-term management. The land acquisition and restoration costs of the alternative are appropriately documented and are reasonable. The project has a high probability of success, with protection and restoration of the property potentially benefiting other natural resources both on site and in the Perdido watershed. No collateral injuries to natural resources are anticipated. Public health and safety issues are not expected to be a concern.

3.1.3 Bayfront Park Restoration and Improvement Phases IIa and IIb

3.1.3.1 Project Summary

Under this alternative, Phase II of the shoreline recreational enhancements project at Mobile County's Bayfront Park would be fully implemented. For further project details, see Section 2.6.2.

3.1.3.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.*

This alternative would advance the Trustees' goal of increasing beach-going and other shoreline recreational opportunities by funding the creation of a pocket beach and other recreational amenities at Bayfront Park. The park is located on the southwestern shore of Mobile Bay in an area that, although not directly injured by oiling or response activities, is located near shorelines on Dauphin Island and Mississippi Sound that were affected. According to the Mobile County Commission, Bayfront Park generally draws in a more local group of residents than those who visit Dauphin Island itself. Overall, this alternative has a reasonable nexus to the DWH oil spill because of its proximity to oiled areas and its targeted ability to compensate a population of local, underserved residents injured by the DWH oil spill with recreational opportunities similar to those that were lost.

Description of Benefits. The Bayfront Park Restoration and Improvement Phases IIa and IIb alternative would create new and improved access to recreational amenities on the shore of Mobile Bay and is expected to be used predominantly by residents of southern Mobile County. The DWH oil spill affected residents in this area, but to date, this part of southern Mobile County has not received substantial investments of restoration funds for loss of recreational services. The area around Bayfront Park has limited local public access opportunities for shoreline recreation, particularly beaches that are close enough to allow for quick, short-duration visits. The majority of waterfront property on the western shore of Mobile Bay is privately owned or lacks sufficient infrastructure to encourage public use. In Phase II, new shoreline recreational opportunities would be created by constructing a pocket beach at Bayfront Park. In addition, the playground improvements, new restrooms, improved access roads, parking and footpaths, and a reconstructed boardwalk would further enhance the visitor experience,

particularly bird watching because Bayfront Park is a designated stop on the Alabama Coastal Bird Trail (ADCNR, 2012). This infrastructure is expected to serve the public for at least several decades.

As part of the Phase I E&D work conducted for RP I/EIS, a survey of park users was administered to gauge public interest in improvements. The survey suggests the proposed recreational amenities would be responsive to public demand. For example, more than half of surveyed users identified new boardwalks and creation of a new beach for swimming and access to paddle sports as *Extremely Important*. Thirty-seven percent of respondents also identified improvements to the Playground Equipment/Fitness Area as *Extremely Important* (Mobile County, 2019).

Scale of Benefits. The Mobile County Commission anticipates that the benefits of this alternative would accrue primarily to residents of southern Mobile County with more limited benefits accruing to visitors passing Bayfront Park on their way to Dauphin Island. The magnitude of the recreational benefits for the alternative would primarily be a function of park visitation. The benefits would likely take two forms—enhancements to the recreational experiences of current visitors and increases in overall visitation at the park due to increased parking capacity. As noted above, many existing visitors noted that the proposed improvements would directly enhance their recreational experiences at Bayfront Park. The Mobile County Commission anticipates that the new and enhanced amenities would also lead to substantial increases in visitation. The Commission estimates the park could expect to see 25 percent more vehicles and up to 40 percent more visitors on peak use days (Mobile County Environmental Services, 2019).

Public Access. The recreational benefits of this alternative would be broadly available to the public. Mobile County currently anticipates that no user or parking fees would be charged at the park over the life of the project improvements. Because of the lack of public transportation in the area, however, benefits would likely accrue primarily to individuals who own vehicles and have sufficient disposable income to drive to the site. During the peak summer season, parking capacity could limit the total benefits.

Location. The southwestern shore of Mobile Bay has limited public beach and shoreline recreational access, implying a high value for the incremental benefits attributable to this alternative. The alternative is within a short drive of Mobile and would be available to a large potential visitor population, although it is primarily expected to benefit the underserved, more local population residing in the southern portions of the county.

Other Benefit Considerations. Because public beach and shoreline access along southwestern Mobile Bay is in short supply, adequate demand for an expanded beach and improved recreational amenities at Bayfront Park is expected. But these improvements are not anticipated to lead to overcrowding because the facility parking constraints limit the potential for overuse. The AL TIG is not currently planning any other projects along the western shore of Mobile Bay, so implementation of the alternative is not expected to be duplicative of other restoration initiatives.

3.1.3.3 Cost to Carry Out the Alternative

The proposed cost to fund the Phases IIa and IIb improvements at Bayfront Park is $4,683,304. These funds would be directed solely to the oversight and construction of infrastructure to improve access to coastal natural resources. The Mobile County Commission developed the estimated infrastructure costs based on the detailed Phase 1 E&D study. If the AL TIG were to select the alternative, it would go through Mobile County's competitive bidding process to ensure the reasonableness of the costs. No land acquisition would be required for this alternative because Mobile County already owns the site. Mobile County would continue to bear all future costs of maintaining Bayfront Park. These costs are not

included in the proposed budget. Based on its review, the AL TIG finds the proposed costs of the alternative to be reasonable.

3.1.3.4 Likelihood of Success

The alternative's goal of enhancing public recreational access to and the enjoyment of coastal areas along southwestern Mobile Bay has a high likelihood of success. Surveys indicate public demand for these amenities. No land acquisition would be required, and the Mobile County Commission has a history of successfully implementing and managing similar recreational improvement projects as part of its natural resource management responsibilities at public parks and other county-owned properties.

3.1.3.5 Avoids Collateral Injury

Implementation of the alternative is not expected to cause any net collateral damage to the environment. Construction of shoreline improvements, however, is contingent on the completion of modeling to determine final design/placement of materials to prevent negative impacts on adjacent shorelines and/or sediment transport. This issue is discussed more fully in Chapter 4 of this Draft RP III/EA.

3.1.3.6 Benefits More Than One Natural Resource or Service

The primary NRDA benefits of this alternative would be to provide and enhance recreational use. In commenting on the project during the E&D phase; however, staff from the Mobile Bay National Estuary Program noted that prior to the hardening of the shoreline at Bayfront Park, the beach was one of the best spots to find seagrass in the area (Mobile County, 2019). The possible reestablishment of seagrass beds once the new beach is constructed is a potential benefit of the project.

3.1.3.7 Effects on Public Health and Safety

Adverse impacts on public health and safety are not expected from the alternative. To minimize public health impacts, Mobile County would continue to provide and maintain trash receptacles at the park. No adverse changes to current parking and traffic patterns are anticipated. The alternative would be fully compliant with ADA-accessibility guidelines, and upgrades would comply with current building codes to ensure public safety.

3.1.3.8 Summary OPA Evaluation: Bayfront Park Restoration and Improvement Phases IIa and IIb

The OPA evaluation indicates that implementation of this alternative would advance the Trustees' goal of enhancing shoreline recreational opportunities in coastal Alabama by upgrading recreational infrastructure and constructing a pocket beach at Bayfront Park. The evaluation indicates that the costs of the alternative are well documented and reasonable. The alternative has an appropriate nexus to the recreational injury caused by the DWH oil spill and is expected to benefit the public over an extended time frame. The alternative, which would provide public access to and enhance the types of natural resource services that were injured by the DWH oil spill, has a high probability of success and is not anticipated to cause any collateral damage. The alternative could benefit seagrass resources that previously existed at the project site. Finally, public health and safety issues are not expected to be a concern.

Relative to the Bayfront Park Restoration and Improvement Phase IIa Implementation alternative, the primary benefit of fully funding this alternative would be the creation of a new set of benefits associated with the boardwalk and trail. Construction of the boardwalk would create opportunities for bird watching, wildlife viewing, and wetlands education that would not otherwise exist. The survey indicates that a new boardwalk would be valued highly by a majority of current visitors.

3.1.4 Bayfront Park Restoration and Improvement Phase IIa

3.1.4.1 Project Summary

This alternative would fund Phase IIa of the shoreline recreational improvement project at Mobile County's Bayfront Park; it would exclude the boardwalk and overlooks, additional improvements to walkways, and some of the proposed ADA-accessible parking at the park. For further project details, see Sections 2.6.2 and 2.6.3.

3.1.4.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.*

This alternative would advance the Trustees' goal of increasing beach-going and other shoreline recreational opportunities by funding the creation of a pocket beach and a more limited set of other recreational amenities at Bayfront Park (compared to the fully funded Bayfront Park Restoration and Improvement Phases IIa and IIb alternative). Like the fully funded option, this alternative has a reasonable nexus to the DWH oil spill because of its proximity to oiled shorelines and its targeted ability to compensate a population of local, underserved residents injured by the DWH oil spill with recreational opportunities similar to those that were lost.

Description of Benefits. The Bayfront Park Restoration and Improvement Phase IIa alternative would create new and improved access to recreational amenities located on the shore of Mobile Bay and is expected to be used predominantly by residents of southern Mobile County. The major difference between this and the fully funded Bayfront Park Restoration and Improvement Phase IIa and IIb alternative is the absence of the reconstructed boardwalk and associated trail. This amenity does appear to be an important feature of Bayfront Park for many users. The Phase I E&D survey of park users found that 54 percent of respondents indicated new multi-use boardwalks and paths were "Extremely Important" (Mobile County, 2019). However, the remaining amenities, including the pocket beach and playground improvements, were also highly valued by survey respondents. Given the high user-day value typically associated with shoreline use visits, it is expected that partially funding the Bayfront Park enhancements—particularly the pocket beach and playground enhancements—would still provide substantial new benefits to visitors to Bayfront Park.[16]

Scale of Benefits. An estimate of how Bayfront Park visitation would differ if the boardwalk, walkway, and ADA parking improvements were not included in the project cannot be calculated with existing data. However, this alternative would likely result in somewhat lower visitation than the full Phase IIa and IIb alternative. Reconstructing the boardwalk and overlooks, which provide access to the park's wetland area, would create new wildlife viewing and bird watching opportunities that would not exist when this component of the project is excluded. Similarly, an expected decline in use by individuals requiring ADA access is anticipated.

Public Access. Removal of the boardwalk and other amenities is not expected to alter the public access attributes of this alternative relative to the full implementation of Bayfront Park Restoration and Improvement Phases IIa and IIb (see Section 3.1.3.2), except that it would provide less ADA accessibility than the more comprehensive alternative because of the reduction in ADA-accessible parking spaces.

[16] The Trustees' study estimated the value of a lost shoreline use user-day to be $36.25 (PDARP/PEIS, p. 4-664).

Location. Removal of the boardwalk and other amenities is not expected to alter the locational attributes of this alternative relative to the full implementation of Bayfront Park Restoration and Improvement Phases IIa and IIb (see Section 3.1.3.2).

Other Benefit Considerations. Removal of the boardwalk and other amenities is not expected to alter substantially the additional benefit considerations discussed above for the full implementation of Bayfront Park Restoration and Improvement Phases IIa and IIb (see Section 3.1.3.2).

3.1.4.3 Cost to Carry Out the Alternative

The proposed cost to fund the Bayfront Park Phase IIa is $3,631,679. These costs differ from those for the full Bayfront Park Restoration and Improvement Phase IIa and IIb alternative only in so far as they reflect the removal of construction costs for the boardwalk and overlooks, the walkway, and some of the ADA parking improvements, and Trustee oversight of the work. Based on its review (and the analysis described in Section 3.1.3.3), the AL TIG finds the remaining proposed costs of the alternative to be reasonable and appropriate.

3.1.4.4 Likelihood of Success

Like the more comprehensive Bayfront Park Phase IIa and IIb project, implementation of this alternative would enhance public recreational access to and enjoyment of coastal areas along southwestern Mobile Bay. However, because the project would not include the boardwalk, certain walkway improvements and some of the ADA-accessible parking, this alternative would not be as effective at meeting the AL TIG's goals as the more comprehensive Bayfront alternative discussed in Section 3.1.3.4 above.

3.1.4.5 Avoids Collateral Injury

This alternative would avoid collateral injury, subject to the same contingencies outlined for the more comprehensive Bayfront Park alternative in Section 3.1.3.5 above.

3.1.4.6 Benefits More Than One Natural Resource or Service

This alternative could benefit seagrass as discussed for the more comprehensive Bayfront Park Phase IIa and IIb alternative in Section 3.1.3.6 above.

3.1.4.7 Effects on Public Health and Safety

Like the more comprehensive Bayfront Park Phase IIa and IIb project, this alternative is not expected to affect public health or safety, as discussed in Section 3.1.3.7 above.

3.1.4.8 Summary OPA Evaluation: Bayfront Park Restoration and Improvement Phase IIa

The OPA evaluation indicates that implementation of this alternative advances the Trustees' goal of enhancing shoreline recreational opportunities in coastal Alabama through construction of a pocket beach and a limited upgrade of recreational amenities at Bayfront Park. However, relative to full implementation of Bayfront Park Restoration and Improvement Phase II, this more limited implementation alternative would likely yield a reduced level of public benefits. Specifically, this alternative is expected to result in reduced bird watching and wildlife viewing benefits because of the absence of the boardwalk and overlook improvements. These foregone benefits are potentially substantial given the park is the only destination on the Alabama Coastal Bird Trail located between Mobile and Dauphin Island. Also, the alternative would not make available some of the ADA-accessible parking improvements in the more comprehensive alternative. These would provide expanded coastal access to another historically underserved group. Nonetheless, it is anticipated that benefits from use of the pocket beach and playground would be substantial for this alternative due to the high individual

user-day value for shoreline use visits and the expectation that this amenity would draw new users to Bayfront Park.

3.1.5 Gulf State Park Pier Renovation

3.1.5.1 Project Summary

This alternative would fund the renovation of the fishing and wildlife viewing pier located at Gulf State Park in Gulf Shores, Alabama. For further project details, see Section 2.6.4.

3.1.5.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.*

The Gulf State Park Pier Renovation alternative would advance the Trustees' goal of increasing recreational fishing and wildlife viewing opportunities in Alabama waters by funding the renovation and enhancement of existing infrastructure. The alternative has a nexus to the DWH oil spill because of its location at Gulf State Park, an area that was directly oiled during the DWH oil spill. The alternative is designed to maintain and enhance the public's access to pier-fishing and wildlife viewing opportunities that would otherwise become unavailable because the existing pier is deteriorating. The recreational opportunities that would be created under this alternative are the same shoreline uses that were lost as a result of the DWH oil spill (i.e., lost user-days of pier-fishing, wildlife viewing). Visitors to the coastal pier, the same user population that the DWH oil spill affected, would benefit under this alternative. The alternative represents "in-place, in-kind" restoration and is fully consistent with OPA objectives for compensatory restoration.

Description of Benefits. Renovation of the pier would create fishing and wildlife viewing user-days that would not exist if the pier were closed because of the ongoing deterioration of the decking. Pier-fishing locations are limited in Baldwin County; the nearest existing publicly accessible alternative is located at the Fort Morgan Historic Site, more than 20 miles to the west. The Gulf State Park Pier is a popular destination for shoreline recreation, clearly demonstrating the value to visitors of maintaining access to the site. The proposed infrastructure is expected to serve the public for at least several decades.

Scale of Benefits. Based on ADCNR's data on entry fees collected at the pier, at least 100,000 people visit the pier each year.[17] Actual visitation is likely substantially greater because ADCNR's estimate is based on entry fees for adults who are fishing and does not account for non-fishing adults who enter at a lower cost or children who are age 11 and under and enter the pier free when accompanied by an adult.

Public Access. The recreational benefits of this alternative would be broadly available to the public. A nominal charge for entry to the pier would be required ($9 per adult for fishing, $3 per adult for wildlife viewing or sightseeing, and reduced fees for children and for multiday or season passes). This fee is not expected to be a significant impediment for visitors because the same fees are charged currently and the pier is heavily used. However, because public transportation to Gulf State Park is lacking, the alternative's benefits would likely accrue primarily to individuals who own vehicles and have sufficient

[17] This cost is estimated assuming reported gate receipts of $919,121 in Fiscal Year 2018 divided by the single day charge for adults fishing ($9). This represents a lower bound on visitation because children enter free, and those not fishing can enter for $3. Also, individuals can purchase weekly, monthly, semi-annual, or annual passes for the pier, all at a reduced cost relative to the daily pass.

disposable income to drive to the park and pay the entry fee. During the peak summer season, parking capacity and crowding could limit the total benefits.

Location. The Gulf Shores/Orange Beach/Fort Morgan Peninsula region, an area where recreational fishing is a popular activity, has limited public pier-fishing opportunities, implying a high value for incremental benefits attributable to this alternative. The pier is within 1.5-hour drive of Mobile, Alabama and would be available to a large potential visitor population.

Other Benefit Considerations. Because of the current experience at the pier, sufficient demand for pier fishing and pier-based wildlife viewing at the site is expected, and the pier is anticipated to operate at full capacity during at least part of the year. If the Gulf State Park Pier were to be closed, current users would incur additional costs and travel time to visit other sites for pier fishing and wildlife viewing. Closure of the pier has the potential to create overcrowding at other shorefishing locations on the Fort Morgan Peninsula because more than 100,000 annual visitors would shift their activities to other areas, potentially diminishing the value of recreational experiences for users of those alternative sites. Finally, the use of sustainably sourced decking materials for the pier renovation would be an environmental stewardship benefit that would be highlighted through education materials at the pier, as would the decrease in light pollution from wildlife-friendly lighting improvements and non-polluting fish cleaning station that would no longer attract predator species to the pier.

3.1.5.3 Cost to Carry Out the Alternative

The proposed cost to plan and renovate the Gulf State Park Pier is $2,447,021. These funds would be directed solely to the planning and construction of infrastructure that improves access to coastal natural resources. ADCNR developed the estimated infrastructure costs based on similar past projects. The estimates indicate that the alternative could be implemented at a reasonable cost. If the AL TIG were to select the alternative, it would go through the State of Alabama's competitive bidding process to further ensure the reasonableness of the costs. The State of Alabama already owns the site, so no land acquisition would be necessary. Fees collected for entry to the site would be used for operation and maintenance of the pier over the life of the alternative. This fee may be adjusted over time to reflect changes in the ongoing operating and maintenance costs of the pier. These maintenance expenses, funded through entry fees, are not included in the budgeted cost of this alternative.

3.1.5.4 Likelihood of Success

The goal of enhancing the public's recreational fishing and wildlife viewing access and enjoyment at Gulf State Park has a high likelihood of success. There is proven demand for the facility. No land acquisition is required, and ADNCR already successfully operates the Gulf State Park Pier as part of its day-to-day natural resource management responsibilities. Also, managing a construction effort of this type is well within the scope of ADCNR's past experience.

3.1.5.5 Avoids Collateral Injury

Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this Draft RP III/EA.

3.1.5.6 Benefits More Than One Natural Resource or Service

The primary NRDA benefits of this alternative would be to provide and enhance recreational uses. The installation of wildlife-friendly light fixtures on the pier and in the parking areas would benefit marine and terrestrial wildlife in the area. Replacing the existing fish cleaning station with a non-polluting one that no longer discharges to the ocean would also reduce the concentration of predator species and

restore a more natural feeding regime in the nearshore around the pier. Use of sustainably sourced decking materials for the project would provide natural resource benefits.

3.1.5.7 Effects on Public Health and Safety

Adverse impacts on public health and safety are not expected under this alternative. To minimize public health impacts, Gulf State Park would continue to provide and maintain trash receptacles on the pier. No changes to historical parking and traffic patterns are anticipated. The alternative would be fully compliant with ADA-accessibility guidelines, and lighting improvements and upgrades would comply with current building codes to ensure public safety.

3.1.5.8 Summary OPA Evaluation: Gulf State Park Pier Renovation

The OPA evaluation indicates that implementation of the Gulf State Park Pier Renovation alternative would advance the Trustees' goals of enhancing and increasing shoreline recreational opportunities in coastal Alabama by providing continued access to fishing and wildlife viewing at Gulf State Park. The alternative has a nexus to the recreational injury caused by the DWH oil spill and can reasonably be expected to benefit the public over an extended time frame. The existing decking would be replaced with sustainably sourced materials, and the renovated pier facility would have wildlife-friendly lighting and a non-polluting fish cleaning station. The costs of the alternative are well documented, reasonable, and appropriate. The alternative has a high probability of success and is not anticipated to cause any collateral damage. Implementation would benefit other marine and terrestrial wildlife resources in and around the project site. Finally, public safety issues are not expected to be a concern.

3.1.6 Perdido Beach Public Access Coastal Protection

3.1.6.1 Project Summary

Under this alternative, recreational beach access at two nearly adjacent locations in Perdido Beach, Alabama, would be enhanced and protected. For further project details, see Section 2.6.5.

3.1.6.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.*

This alternative would advance the Trustees' goal of increasing recreational opportunities in Alabama by funding work to prevent the loss of public beaches to erosion. The project is located on the Alabama shore of Perdido Bay, which experienced oiling during the DWH oil spill (NOAA, 2019a). Because of its proximity to oiled areas and its targeted ability to compensate recreational users through the provision of beach-going opportunities similar to those lost due to oiling and subsequent cleanup activities, the alternative has a clear nexus to the DWH oil spill.

Description of Benefits. The Town of Perdido Beach Public Access Coastal Protection alternative would allow continued access to two beaches along the shore of Perdido Bay that, because of ongoing erosion of the shoreline, would not otherwise be available in the absence of the proposed improvements. These two beaches offer valuable public benefits along Alabama's Perdido Bay shoreline, an area of mostly private beaches with limited public access opportunities. Each beach provides permanent public access and parking. Recreational opportunities would include typical beach-going activities such as swimming,

sunbathing, walking, snorkeling, and wildlife viewing. The proposed nearshore infrastructure would be designed to be sustainable and is expected to serve the public for at least several decades.[18]

Scale of Benefits. Existing public beach access along the Alabama shore of Perdido Bay is limited, and few substitute locations are available. It is anticipated that the benefits under this alternative would accrue to both neighborhood residents accessing the sites on foot or by bicycle, as well as visitors from farther away traveling to the area by private car. Total use of the sites would be a function of parking utilization plus visitation from the neighborhood. A combined total of approximately 50 parking spaces would be available at the two sites on a year-round basis. Assuming an average utilization rate of about 35 percent, implementation of the alternative would yield more than 25,000 beach user-days each year for those arriving by car.[19] If similar numbers arrive on foot or by bicycle, the total annual use for the two beaches would be about 50,000 user-days per year.

Public Access. The recreational benefits of this alternative would be broadly available to the public. The Town of Perdido Beach does not currently anticipate that any parking fees would be charged at either beach over the life of the project. However, public transportation in the area is lacking, benefits would likely accrue primarily to individuals who own vehicles and have sufficient disposable income to drive to the area or to visitors who are able to reach the beach on foot or by bicycle. During the peak summer season, parking capacity could limit the total benefits.

Location. The Alabama shore of Perdido Bay has limited public beach and shoreline recreational access, implying a high value for the incremental benefits attributable to this alternative. The alternative is within a short drive of Mobile, Alabama, and would be available to a large potential visitor population.

Other Benefit Considerations. Demand clearly exists for this project based on current use of the two beaches targeted for infrastructure enhancements and restoration. If the beaches were to erode and need to be closed, current users of these beaches would incur additional costs and travel time to visit other sites for beach recreation. Closure of these two beaches also could create crowding at other beaches in the area as beach-goers (estimated at 50,000 visitor-days per year) relocate to other sites, potentially diminishing the value of recreational experiences for users of those alternative beaches.

3.1.6.3 Cost to Carry Out the Alternative

The proposed cost for the Town of Perdido Beach Public Access Coastal Protection alternative is $333,300. These funds would be directed solely to the construction of infrastructure that would improve access to shoreline resources around Perdido Bay. The budget for the alternative includes funds for planning and project management, and Trustee oversight, infrastructure construction, materials, and monitoring. The Town of Perdido Beach developed the estimated infrastructure, materials, and project management costs based on analysis of individual tasks and local market data. ADCNR added estimates for Trustee oversight and contingency based on past experience. Overall, the AL TIG finds these costs to be based on appropriate analysis and reasonable for this stage of project development. If selected, the alternative would go through the State of Alabama's competitive bidding process to further ensure the reasonableness of the infrastructure costs. The Town of Perdido Beach would be responsible for future

[18] A hydrographic study to be completed during the final design phase for the project will confirm the ability of the proposed design to function effectively over time.

[19] This reflects the 35 percent utilization rate with cars in the lot turning over twice daily and an average of two occupants per car. If the same number of people arrive on foot or bike as by car and 75 percent of annual use occurs during three summer months, this suggests around 200 visitors on average per beach per day during peak summer periods.

maintenance of the project infrastructure. These future maintenance costs are not included in the budget for the alternative.

3.1.6.4 Likelihood of Success

The alternative's goal of maintaining public recreational access to and enjoyment of coastal areas along Perdido Bay has a reasonable likelihood of success, although final implementation of the project would be contingent on a hydrographic study confirming the effectiveness of the proposed design. In addition, the project is relatively small and well within the historical construction management experience of the Town of Perdido Beach. Once construction is complete, demand for recreation at the two beaches is expected to continue at levels similar to those in the past.

3.1.6.5 Avoids Collateral Injury

Implementation of the alternative is not expected to cause any net collateral injury to the environment. This conclusion, however, is contingent on the results of the hydrographic analysis that would be conducted as part of the final design and permitting process for this project. The reasons for this preliminary conclusion that the project avoids collateral damage are discussed more fully in Chapter 4 of this Draft RP III/EA.

3.1.6.6 Benefits More Than One Natural Resource or Service

The primary NRDA benefit of this alternative would be compensatory restoration of recreational services. The alternative, however, also would include the construction of living shorelines and the planting of native vegetation that would be potential sources of ecological benefits. These elements of the project would be designed to further stabilize the shoreline. As an example of the potential for ecological benefits, the living shorelines and wetland plantings are expected to provide valuable nursery habitat for fish.

3.1.6.7 Effects on Public Health and Safety

Implementation of this alternative is not expected to result in any changes to public health and safety. The goal is to protect the two beaches from future erosion through the installation of nearshore breakwaters and living shorelines. These structures would be clearly marked in accordance with Alabama Marine Resources Division or other applicable guidelines so as not present a navigation hazard. Otherwise, the alternative would not alter the nature of current recreational activities at the two beaches and therefore would not result in any negative incremental impacts on public health and safety.

3.1.6.8 Summary OPA Evaluation: Town of Perdido Beach Public Access Coastal Protection

The OPA evaluation indicates that implementation of this alternative would advance the Trustees' goal of enhancing shoreline recreational opportunities in coastal Alabama by constructing infrastructure to prevent the loss of public beaches to coastal erosion. The alternative has a nexus to the recreational injury caused by the DWH oil spill and can reasonably be expected to provide shoreline use benefits to the public over an extended time frame. The costs of the alternative are well documented, reasonable, and appropriate. Preliminary analysis suggests the alternative would not cause any collateral damage, although this conclusion would be subject to final confirmation through a required hydrographic study. The alternative would benefit other marine natural resources at the project site. Finally, public safety issues are not expected to be a concern.

3.1.7 BSNWR Recreation Enhancement – Mobile Street Boardwalk

3.1.7.1 Project Summary

This alternative would replace and repair the Mobile Street boardwalk, which provides Gulf beach access at BSNWR. For further project details, see Section 2.6.6.

3.1.7.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.*

This alternative would advance the Trustees' goal of increasing coastal recreation in Alabama by enhancing existing recreational infrastructure at BSNWR. The refuge is located on the Fort Morgan Peninsula, which experienced oiling during the DWH oil spill (NOAA, 2019a). The recreational opportunities that would be created by this alternative are the types of uses that were lost as a result of the spill (i.e., lost user-days of shoreline recreation, including swimming, walking, shorefishing, kayaking, and bird watching). Recreational shoreline visitors, the user population affected by the spill, would directly benefit from this alternative. Because the beaches at BSNWR were oiled, the alternative represents "in-place, in-kind" restoration and is fully consistent with OPA objectives for compensatory restoration.

Description of Benefits. The BSNWR Recreation Enhancement alternative is expected to allow continued use of recreational infrastructure at the refuge and to create opportunities for expanded use over time in response to growing public demand. The Mobile Street boardwalk and the associated parking lot provide highly valued access to the ocean-fronting beaches at the refuge and are Bon Secour's most intensively used recreational amenity. The boardwalk is currently in poor condition and would need to be closed in the near future if not reconstructed. BSNWR staff consider replacement to be an urgent priority for the refuge given that approximately 57,000 visitors benefit annually from it and the associated parking facilities. The new ADA-accessible boardwalk would be built with long-lasting composite materials and is expected to serve the public for at least several decades.

Scale of Benefits. BSNWR is a major provider of outdoor recreational experiences on the Fort Morgan Peninsula. The refuge currently attracts approximately 135,000 visitors annually according to BSNWR staff. In the short run, closure of the boardwalk would impede beach access to approximately 57,000 visitors annually. A rebuilt boardwalk is expected to restore this access and serve additional visitors, with projected growth eventually adding an additional 7,000 visitors a year, for a total of 64,000 users—an increase of 12 percent over current levels.

Public Access. The recreational benefits of this alternative would be broadly available to the public. BSNWR currently does not anticipate that any access or parking fees would be charged at the refuge. Because of public transportation in the area is lacking, benefits would likely accrue primarily to individuals who own vehicles and have sufficient disposable income to drive to the area or to visitors who are able to reach the beach on foot or by bicycle. During the peak summer season, parking capacity could limit the total benefits.

Location. BSNWR is within a 1.5-hour drive of Mobile, Alabama, so the reconstructed boardwalk and parking would be available to a large potential visitor population. A limited number of sites along the Fort Morgan Peninsula provide recreational opportunities similar to those offered by BSNWR. Because of the high degree of development along the Alabama coast, the undeveloped character of beaches at the refuge provide a relatively unique recreational experience, implying a high value for the incremental benefits attributable to this alternative.

Other Benefit Considerations. Given current visitation at BSNWR's Mobile Street boardwalk, demand is sufficient to justify investment in rebuilding the infrastructure even without the anticipated growth in the number of visitors. If the Mobile Street boardwalk needed to be closed as a beach access point, current users would likely incur additional costs and travel time to visit other sites for beach recreation. Closure could create crowding at other locations as the large number of beach-goers relocate to alternative sites along the coast, potentially diminishing the value of recreational experiences for users of those other beaches.

3.1.7.3 Cost to Carry Out the Alternative

The proposed cost to fund the BSNWR Recreational Enhancement – Mobile Street Boardwalk alternative is $1,189,899. These funds would be directed solely to the oversight, construction, planning, and monitoring of recreational infrastructure that either maintains or increases access to coastal natural resources. USFWS developed the estimated costs of the alternative based on similar past projects. The estimates indicate that the alternative could be implemented at a reasonable cost. Adherence to USDOI contracting procedures is expected to further ensure the reasonableness of the costs. No land acquisition would be required for this alternative; the federal government already owns the site. USFWS would continue to bear all future costs of maintaining BSNWR with costs included in the budget for this alternative.

3.1.7.4 Likelihood of Success

The alternative's goal of maintaining and increasing public recreational access to and enjoyment of BSNWF has a high likelihood of success. USFWS has demonstrated experience implementing a project of this type. It already successfully manages the Mobile Street infrastructure, which is now reaching the end of its useful life and needs to be reconstructed. Use data collected by the agency indicates sufficient public demand for the proposed components of this alternative.

3.1.7.5 Avoids Collateral Injury

Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this Draft RP III/EA.

3.1.7.6 Benefits More Than One Natural Resource or Service

The primary NRDA benefit of this alternative is to provide and enhance recreational access and uses. The alternative, however, would also contribute to preserving and restoring threatened and endangered species through the construction of infrastructure explicitly designed to enhance and support the restoration of the habitats on which they depend (e.g., through prevention of erosion). Natural resources would benefit from the use of sustainable, long-lasting composite materials for the boardwalk.

3.1.7.7 Effects on Public Health and Safety

Adverse impacts on public health and safety are not expected to result from this alternative. To minimize public health impacts, USFWS would continue to provide maintenance and upkeep to ensure the safety of the proposed boardwalk. No major changes are expected to traffic patterns as a result of parking improvements, and consequently, no traffic impacts are anticipated. Porous pavement would be used and provide suitable cover for ADA-compliant access.

3.1.7.8 Summary OPA Evaluation: BSNWR Recreation Enhancement – Mobile Street Boardwalk

The OPA evaluation indicates that implementation of this alternative would advance the Trustees' goal of enhancing and increasing shoreline recreational opportunities in coastal Alabama by replacing the

Mobile Street boardwalk and the associated parking lot improvements at BSNWR. The alternative has a nexus to the recreational injury caused by the DWH oil spill and can reasonably be expected to provide benefits to the public over an extended time frame. The alternative would provide continued public access to and enhance enjoyment of the types of natural resources that were injured by the DWH oil spill and has a high probability of success. The costs of the alternative are well documented, reasonable, and appropriate. The alternative is not anticipated to cause any collateral damage. While its primary focus is recreational use, the alternative also has the potential to help preserve and support restoration of sensitive ecosystems and species. The proposed use of sustainable, composite materials for the boardwalk also benefits natural resources. Finally, public health and safety issues are not expected to be a concern.

3.1.8 BSNWR Recreation Enhancement – Centennial Trail Boardwalk

3.1.8.1 Project Summary

This alternative proposes to rebuild the Centennial Trail boardwalk, which provide a major trail connection at BSNWR. For further project details, see Section 2.6.7.

3.1.8.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.*

This alternative would advance the Trustees' goal of increasing coastal recreation in Alabama by enhancing existing recreational infrastructure at BSNWR. The refuge is located on the Fort Morgan Peninsula, which experienced oiling during the DWH oil spill (NOAA, 2019a). The recreational opportunities that would be created by this alternative are the types of uses that were lost as a result of the spill (i.e., lost user-days of shoreline recreation, including swimming, walking, shorefishing, kayaking, and bird watching). Recreational shoreline visitors, the user population affected by the spill, would directly benefit from this alternative. Because the beaches at BSNWR were oiled, the alternative represents "in-place, in-kind" restoration and is fully consistent with OPA objectives for compensatory restoration.

Description of Benefits. This alternative would replace and reopen the currently closed Centennial Trail boardwalk, which would restore a critical 2-mile long, east-west trail connection in the refuge. Recent user surveys indicate that visitors value this trail. This project is priority project for USFWS because of the trail's popularity and importance as a major east-west connector in the refuge. The project would reconnect the Jeff Friend Trail with the Pine Beach Trail and Observation Tower and provide visitor access to Gator Lake and the west end of Little Lagoon. The new, ADA-accessible boardwalk would be built with long-lasting composite materials and is expected to serve the public for at least several decades.

Scale of Benefits. BSNWR is a major provider of outdoor recreational experiences on the Fort Morgan Peninsula. The refuge currently attracts approximately 135,000 visitors annually according to refuge staff. The current closure of the Centennial Trail boardwalk has affected approximately 7,000 users of the trail annually. Rebuilding the boardwalk is expected to restore this use and serve increasing numbers of visitors. Projected growth adds 6,000 users, for an eventual total of 13,000 trail users annually—an increase of more than 85 percent from current levels.

Public Access. The recreational benefits of this alternative would be broadly available to the public. BSNWR currently does not anticipate that any access or parking fees would be charged at the refuge. Because public transportation in the area is lacking, benefits would likely accrue primarily to individuals

who own vehicles and have sufficient disposable income to drive to the area or to visitors who are able to reach the beach on foot or by bicycle. During the peak summer season, parking capacity could limit the total benefits.

Location. BSNWR is within a 1.5-hour drive of Mobile, Alabama, so the reconstructed boardwalk would be available to a large potential visitor population. A limited number of sites along the Fort Morgan Peninsula provide recreational opportunities similar to those offered by BSNWR. Because of the high degree of development along the Alabama coast, the undeveloped character of the refuge provides a relatively unique recreational experience, implying a high value for the incremental benefits attributable to this alternative.

Other Benefit Considerations. Given past estimates of Centennial Trail use, demand to justify investment in rebuilding this infrastructure is sufficient even without the anticipated growth in the number of visitors. Compared to the Mobile Street Boardwalk alternative, however, this project, while very close in cost, would benefit only a small fraction of the number of visitors. In that respect, the Mobile Street Boardwalk alternative is considerably more cost-effective.

3.1.8.3 Cost to Carry Out the Alternative

The proposed cost to fund the BSNWR Recreational Enhancement – Centennial Trail Boardwalk alternative is $1,711,771. These funds would be directed solely to the oversight, construction, planning, and monitoring of recreational infrastructure that either maintains or increases access to coastal natural resources. USFWS developed the estimated costs for the alternative based on similar past projects. The estimates indicate that the alternative could be implemented at a reasonable cost. Adherence to USDOI contracting procedures is expected to further ensure the reasonableness of the costs. No land acquisition would be required for this alternative; the federal government already owns the site. USFWS would continue to bear all future costs of maintaining BSNWR with costs included in the budget for this alternative.

3.1.8.4 Likelihood of Success

The alternative's goal of maintaining and increasing public recreational access to and enjoyment of the BSNWF has a high likelihood of success. USFWS has demonstrated experience implementing a project of this type. In the past, BSNWR has successfully managed boardwalks that have reached the end of their useful life and need to be reconstructed. Use data collected by the agency indicates sufficient public demand for the proposed rebuilding the proposed infrastructure.

3.1.8.5 Avoids Collateral Injury

Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this Draft RP III/EA.

3.1.8.6 Benefits More Than One Natural Resource or Service

The primary NRDA benefit of this alternative is to provide and enhance recreational access and uses. The alternative, however, would also contribute to preserving and restoring threatened and endangered species through the construction of infrastructure explicitly designed to enhance and support the restoration of the habitats on which they depend (e.g., through prevention of erosion). Natural resources would benefit from the use of sustainable, long-lasting composite materials for the boardwalk.

3.1.8.7 Effects on Public Health and Safety

Adverse impacts on public health and safety are not expected to result from this alternative. To minimize public health impacts, USFWS would continue to provide maintenance and upkeep to ensure the safety of the proposed boardwalk.

3.1.8.8 Summary OPA Evaluation: BSNWR Recreation Enhancement – Centennial Trail Boardwalk

The OPA evaluation indicates that implementation of this alternative would advance the Trustees' goal of enhancing and increasing shoreline recreational opportunities in coastal Alabama by rebuilding the Centennial Trail boardwalk at BSNWR. The alternative has a nexus to the recreational injury caused by the DWH oil spill and can reasonably be expected to provide benefits to the public over an extended time frame. The alternative would restore public access to and enhance enjoyment of the types of natural resources that were injured by the DWH oil spill and has a high probability of success. The costs of the alternative are well documented, reasonable, and appropriate. The alternative is not anticipated to cause any collateral damage. While its primary focus is recreational use, the alternative also has the potential to help preserve and support restoration of sensitive ecosystems and species. Natural resources would benefit from the proposed use of sustainable, composite materials for the boardwalk. Finally, public health and safety issues are not expected to be a concern. Overall, however, the alternative would not be as cost-effective as the BSNWR Recreation Enhancement – Mobile Street Boardwalk alternative.

3.2 BIRDS

3.2.1 Overview of Restoration Goals and Approaches

The Final PDARP/PEIS (Section 5.5.12) established Gulf-wide goals for bird restoration, which the AL TIG refined to a set of two specific goals for bird projects in coastal Alabama. Projects should:

- Increase reproduction or decrease mortality for DWH injured species; or
- Fill important information/data gaps for birds in Alabama.[20]

The projects selected for inclusion in the reasonable range of alternatives for Birds employ the following restoration approaches identified in the Final PDARP/PEIS:

1. Restore and conserve bird nesting and foraging habitat.
2. Establish or reestablish breeding colonies.
3. Protect and conserve marine, coastal, estuarine and riparian habitats.

The remainder of this section discusses the OPA analysis for the individual Bird restoration projects and provides specific reference to each of the OPA criteria.

3.2.2 Stewardship of Coastal Alabama Beach Nesting Bird Habitat

3.2.2.1 Project Summary

Under this alternative, ADCNR would fund the implementation of a stewardship program in coastal Alabama designed to improve habitat conditions for nesting beach birds. For further project details, see Section 2.7.1.

[20] See Chapter 2 and Appendix , Project Screening Methodology and Criteria.

3.2.2.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore or protect habitats on which injured birds rely.*

This alternative would advance the Trustees' goals of protecting and enhancing coastal habitats that are critically important to the nesting success and reproduction of four bird species injured by the DWH oil spill—least terns, black skimmers, snowy plovers, and Wilson's plovers. According to the PDARP, the DWH oil spill resulted in a combined loss—direct mortality plus future lost productivity—of at least 3,900 birds across these four species, clearly establishing a nexus to the DWH oil spill for this alternative.[21]

Recent studies make clear that beach recreation can have major negative impacts on bird populations (Larson, 2016; McGowan and Simons, 2006). Predation by mammals is also an important cause of nest failure in beach nesting birds (Saalfeld, 2011). The Trustees' Strategic Framework for Birds identifies stewardship and predator control as appropriate methods for meeting the Trustees' restoration objectives for beach nesting birds (DWH Trustees, 2017). The activities proposed as part of this alternative—active stewardship and education in conjunction with symbolic or exclusionary fencing, predator control and management, decoy deployment, and habitat and nesting enhancement activities—are expected to result in substantial increases in nesting bird populations. The data collected as part of the MAM efforts would further help the Trustees to focus the program each year on the areas that would benefit most from further stewardship and predator control activities.

3.2.2.3 Cost to Carry Out the Alternative

The proposed cost of the Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative is $2,018,047. The estimate includes direct and indirect costs for stewardship, predator management, deployment of decoys, nesting area and habitat enhancements, MAM, plus project oversight, supervision, and contingency. The cost projections reflect the best estimates of USFWS and ADCNR. The AL TIG reviewed the alternative's costs and finds these costs to be reasonable and appropriate based on similar projects. In particular, stewardship programs often rely heavily on volunteers, making them particularly cost-effective, while simultaneously building public engagement. In addition, combining the various components of this alternative into a single initiative would allow data sharing and would likely increase the overall cost-effectiveness of the efforts. If selected for implementation, the proposed work under this alternative would go through the State of Alabama's competitive bidding process to further ensure the reasonableness of the costs.

3.2.2.4 Likelihood of Success

This alternative has a high likelihood of improving the protection of coastal habitats that are critically important to the nesting success and reproduction of four bird species injured by the DWH oil spill. The proposed stewardship, habitat, and nesting area enhancement approaches have already been demonstrated to be effective along the Gulf Coast and around the country (Burger et al., 2004; Johnson, 2016).[22] Predator control and management programs are a widely used tool for increasing nest success for beach nesting birds and have been implemented by federal Trustee agencies along the Gulf coast (DWH Trustees, 2013; Florida TIG, 2019). Decoy programs of the type proposed as part of this alternative have been demonstrated effective for establishing new nesting sites for beach nesting birds

[21] PDARP, pp. 4-494 to 4-497.

[22] The City of Orange Beach is already successfully managing several islands in the Perdido area for bird species, including the least tern, black skimmer, and great blue heron. This initiative proposes to expand the size of the areas under management.

(Kotliar and Burger, 1984). The Trustees anticipate the alternative's overall likelihood of success would be further improved by implementing the MAM component to provide essential data for further targeting the stewardship and predator management activities over the 3-year life of the initiative.

3.2.2.5 Avoids Collateral Injury

Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this Draft RP III/EA.

3.2.2.6 Benefits More Than One Natural Resource or Service

The primary NRDA benefit of this alternative would be to restore and protect bird species injured by the DWH oil spill. Management of predators, however, is also expected to benefit nesting sea turtles.

3.2.2.7 Effects on Public Health and Safety

The Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative is not expected to affect public health and safety. Bird stewardship and habitat and nest enhancements rely on measures such as public education and symbolic fencing that pose no risks to the general public. Decoy placement similarly poses no risk to the general public. Predator management may involve electric fencing and other activities that could pose risks. Use of such measures, however, would be limited to areas at BSNWR that would be off-limits to the public.

3.2.2.8 Summary OPA Evaluation: Stewardship of Coastal Alabama Beach Nesting Bird Habitat

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' goals of protecting and enhancing coastal habitats that are critically important to the nesting success and reproduction of four bird species injured by the DWH oil spill. The costs of the project are reasonable. The proposed restoration approaches have been demonstrated to be effective across the Gulf of Mexico, giving the alternative a high likelihood of success. Implementation of the alternative is not expected to cause any collateral injury to natural resources and has the potential to also benefit nesting sea turtles. Public health and safety issues are not expected to be a concern.

3.2.3 Stewardship of Coastal Alabama Beach Nesting Bird Habitat—Stewardship and Monitoring Only

3.2.3.1 Project Summary

Under this alternative, ADCNR would fund implementation of a more limited stewardship and monitoring program in coastal Alabama designed to improve habitat conditions for nesting beach birds. For further project details, see Section 2.7.2.

3.2.3.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore or protect habitats on which injured birds rely.*

The alternative differs from the previously discussed Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative in that it includes only the stewardship and monitoring components from the more comprehensive alternative (which also includes predator management, decoy deployment, and other habitat enhancement activities). A program similar to this alternative has been operating in Alabama for 2 years and has produced valuable stewardship benefits for beach nesting birds and useful data for targeting additional stewardship investments. This alternative would be a more limited approach to restoring beach nesting birds than the more comprehensive alternative. Consequently, while still beneficial, this less costly option is not expected to be as effective as the more comprehensive stewardship alternative in advancing the Trustees' goals of protecting and enhancing coastal habitats

that are critically important to the nesting success and reproduction of four bird species injured by the DWH oil spill.

3.2.3.3 Cost to Carry Out the Alternative

The proposed cost of the Stewardship of Coastal Alabama Beach Nesting Bird Habitat—Stewardship and Monitoring Only alternative is $1,895,597. The estimate reflects only the costs for stewardship and monitoring, associated Trustee oversight, and contingency that were reviewed as part of the Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative. Based on a comparison with costs for the previously operating program in Alabama, the AL TIG finds these costs to be reasonable and appropriate.

3.2.3.4 Likelihood of Success

This alternative has a reasonable likelihood of success. The symbolic fencing and education approaches have been proven to be effective at increasing nest success. However, the alternative is expected to be less effective than the more comprehensive Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative because it would not take advantage of synergies created by integrating a more complete set of program activities (i.e., predator management, decoy placement, habitat and nest enhancement) into a single alternative. Such integration would allow implementers to use the knowledge generated by the stewardship activities to efficiently target these other measures, thereby increasing the cost-effectiveness of overall efforts to achieve the restoration goals.

3.2.3.5 Avoids Collateral Injury

Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this Draft RP III/EA.

3.2.3.6 Benefits More Than One Natural Resource or Service

The primary NRDA benefits of this alternative would be to restore and protect bird species injured by the DWH oil spill.

3.2.3.7 Effects on Public Health and Safety

The Stewardship of Coastal Alabama Beach Nesting Bird Habitat—Stewardship and Monitoring Only alternative is not expected to affect public health and safety. Bird stewardship and monitoring rely on measures such as public education, symbolic fencing, and data gathering that pose no risks to the public.

3.2.3.8 Summary OPA Evaluation: Stewardship of Coastal Alabama Beach Nesting Bird Habitat—Stewardship and Monitoring Only

The OPA evaluation indicates that implementation of this alternative would advance the Trustees' goals of protecting and enhancing coastal habitats that are critically important to the nesting success and reproduction of four bird species injured by the DWH oil spill. The costs of the project are reasonable. The proposed restoration approaches have been demonstrated to be effective across the Gulf of Mexico, giving the alternative a reasonable likelihood of success. Implementation of the alternative is not expected to cause any collateral injury to natural resources. Public health and safety issues are not expected to be a concern.

This alternative, while lower cost, would not be as effective at advancing the Trustees' goals as the more comprehensive Stewardship of Coastal Alabama Beach Nesting Bird Habitat. By excluding predator management, decoy placement, and habitat and nest enhancement activities, the alternative would fail to take advantage of synergies that increase the cost-effectiveness of the more comprehensive alternative.

3.2.4 Dauphin Island West End Acquisition

3.2.4.1 Project Summary

Under this alternative, Mobile County would acquire and permanently conserve 838 acres of coastal barrier island habitat and initiate a long-term program of bird restoration initiatives managed jointly with the Town of Dauphin Island. For further project details, see Section 2.7.3.

3.2.4.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore or protect habitats on which injured birds rely.*

This alternative would advance the Trustees' goals of restoring and protecting coastal habitats that are critical to the reproduction and survival of bird species injured by the DWH oil spill. Acquisition of the West Dauphin property represents a unique conservation and restoration opportunity in coastal Alabama. The property is by far the largest undeveloped barrier beach remaining in private ownership along the state's 90-mile coastline. Recent data from the Alabama Coastal Bird Survey reveal the presence of at least 49 avian species injured by the DWH oil spill (eBird.org, 2019).

The Trustees' interest in acquiring the West Dauphin property is motivated by its potential as a source of bird restoration benefits that would only become available if the Trustees are able to implement a long-term restoration program on the 838 acre property. This program would likely include bird stewardship, habitat enhancement, and predator management. Recreational beach and boating access at West Dauphin currently poses threats to nesting birds. The Trustees expect that bird stewardship projects initiated to educate recreational users, and thereby protect nesting sites, would significantly improve reproductive outcomes for birds. Other potential habitat enhancement--including dune restoration, creation of new bird nesting and foraging habitat, and vegetation management--is also expected to increase the reproduction and survival of species injured by the spill. In addition, participants in current Share the Beach efforts, which are focused on protecting sea turtle nests, have noted the presence of predators such as red fox at West Dauphin. This suggests potentially substantial nesting bird benefits would result from implementing a predator management program.[23] In parallel with these restoration measures, the Trustees expect bird watching could become an important ancillary benefit of the acquisition of West Dauphin, assuming future management plans can accommodate this use without impeding the Trustees' primary objective of restoring and protecting bird habitat.

Acquisition of the property by the public is the key to implementing restoration activities. While some of the restoration benefits might be achieved through other forms of agreement, such as conservation easements, only fee simple public ownership guarantees the permanent access to and control of the property needed for long-term stewardship and restoration. The control over management decision making that comes with public ownership is an important consideration for the Trustees in recommending acquisition. In the longer term, ecosystem restoration needs at West Dauphin are highly uncertain. Scientists predict that sea-level rise, in combination with major storms and hurricanes, will cause West Dauphin to slowly migrate in a northerly direction, changing the configuration of the property and modifying its habitats. This will likely necessitate regular updates to restoration and management plans to maintain optimal conditions for bird reproduction (Morton, 2008). As this migration occurs, public ownership will provide the flexibility for ecosystems management that could

[23] Share the Beach is a volunteer program that has been assisting with the nesting and hatching of sea turtles on the Alabama coast since 2003. More than 400 volunteers monitor the 50 miles of sea turtle nesting habitat in Alabama looking for evidence of sea turtle activity during the nesting season. To learn more, visit: http://www.alabamaseaturtles.com.

not be assured if the property were to remain in private hands. A final advantage of public ownership is that it is expected to create opportunities for future leveraging of other government and non-profit funding sources for restoration and management of the property that would not be available to a private owner.

3.2.4.3 Cost to Carry Out the Alternative

The proposed cost of the Dauphin Island West End Acquisition is $6,681,250. These funds would be solely directed to acquiring the land and conducting appropriate restoration planning activities, and initial restoration and management for the property. The budget for the alternative includes funds for land acquisition, planning, restoration, monitoring, project oversight and supervision, and contingency. The land acquisition costs included in the budget are based on a July 2019 Yellow Book appraisal. The Trustees believe acquisition at the Yellow Book price would be a cost-effective approach to meeting their bird conservation objectives. The per acre cost of the West Dauphin property is approximately $6,000.[24] The Trustees view the price as reasonable in light of the cost of other alternatives for meeting their bird restoration objectives. Construction of new barrier island bird habitat would be far more expensive on a per acre basis, even considering the costs of future bird stewardship, habitat enhancement, and predator management programs needed at West Dauphin. The AL TIG also reviewed the costs for the bird restoration and management plan for the property, as well as monitoring, project oversight and supervision, and contingency costs associated with the alternative. Based on similar past efforts, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this alternative to be reasonable and appropriate.

3.2.4.4 Likelihood of Success

The alternative's goals of restoring and protecting the habitats at West Dauphin on which injured birds rely has a high likelihood of success. The land proposed for acquisition has a willing seller, and it is anticipated that final negotiations would lead to its acquisition at a reasonable price. Land acquisitions of this type are a proven approach for achieving conservation goals. The ownership of the property by Mobile County would include a permanent land protection instrument to ensure protection and maintenance of the property in perpetuity. The anticipated future restoration techniques have been widely and successfully implemented. The types of stewardship and habitat enhancement approaches likely to be implemented have been demonstrated to be effective along the Gulf Coast and around the country (Burger et al., 2004; Johnson, 2016). Predator control and management programs are a widely used tool for increasing nest success for beach nesting birds and have been implemented by federal Trustee agencies along the Gulf coast (DWH Trustees, 2013; Florida TIG, 2019). The Trustees anticipate the alternative's overall likelihood of success would be further improved by implementing MAM activities to provide essential data for further targeting the stewardship and predator management activities (Appendix E). Mobile County and the Town of Dauphin Island, which would jointly manage the property, already own other properties managed for conservation objectives. Joint management would require a careful delineation of the roles and responsibilities of each of the parties. Both parties, however, are fully committed to developing a workable plan as part of the future management planning process that would occur in advance of the acquisition, and both parties have extensive experience in land management. All these factors point to a high likelihood of a successful outcome for this alternative.

[24] This is the cost per acre for the approximately 838 acres of island land mass and does not include the submerged lands under ownership.

3.2.4.5 Avoids Collateral Injury

Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this Draft RP III/EA.

3.2.4.6 Benefits More Than One Natural Resource or Services

This alternative is expected to benefit other living coastal and marine resources. Sea turtles currently nest at beaches on the West Dauphin property, and acquisition would ensure that there are no access restrictions preventing the continuation of Share the Beach programs in the future.

3.2.4.7 Effects on Public Health and Safety

The Dauphin Island West End Acquisition alternative is not expected to affect public health and safety. The initiative involves land acquisition and planning, neither of which is expected to result in any activities that cause negative impacts to public health or safety. Future restoration activities are also not expected to have impacts on public health and safety.

3.2.4.8 Summary OPA Evaluation: Dauphin Island West End Acquisition

The OPA evaluation indicates that implementation of this alternative would advance the Trustees' Bird restoration goals by permanently protecting valuable bird habitat and initiating long-term restoration and management of the property. The alternative has a strong nexus to the ecological injury caused by the DWH oil spill. The land acquisition, restoration planning, and initial restoration implementation costs of the alternative are well documented and reasonable. The alternative has a high probability of success and is expected to benefit other natural resources at the West Dauphin property. No collateral injuries to natural resources are anticipated. Public health and safety issues are not expected to be a concern.

3.3 SUMMARY OF OPA EVALUATION

The AL TIG completed the OPA evaluation of ten alternatives across two Restoration Types proposed in the Alabama Restoration Area (see Table 3-1). All the alternatives generally met the OPA criteria, although the evaluations noted differences in the effectiveness of alternatives in achieving the Trustees' goals and related objectives. The AL TIG identified seven preferred alternatives, five focused on providing and enhancing recreational opportunities and two on restoration of birds. In the judgment of the AL TIG, identification at this time of these seven alternatives as preferred maximizes public benefits within the budgetary constraints of this restoration plan.

Table 3-1: Range of Alternatives Evaluated

Alternative	Preferred Y/N	Project Costs
Restoration Type – Provide and Enhance Recreational Opportunities		
Perdido River Land Acquisition (Molpus Tract)	Y	$4,742,540
Bayfront Park Restoration and Improvement Phase IIa and IIb	Y	$4,683,304
Bayfront Park Restoration and Improvement Phase IIa	N	$3,631,679
Gulf State Park Pier Renovation	Y	$2,447,021
Perdido Beach Public Access Coastal Protection	Y*	$333,300
BSNWR Recreation Enhancement – Mobile Street Boardwalk	Y*	$1,189,899

Alternative	Preferred Y/N	Project Costs
BSNWR Recreation Enhancement – Centennial Trail Boardwalk	N	$1,711,771
Restoration Type – Birds		
Stewardship of Coastal Alabama Beach Nesting Bird Habitat	Y	$2,018,047
Stewardship of Coastal Alabama Beach Nesting Bird Habitat— Stewardship and Monitoring Only	N	$1,895,597
Dauphin Island West End Acquisition	Y	$6,681,250
Total Funding for Preferred Alternatives		**$22,095,361**

* The Trustees are not proposing to exceed the allocation for Provide and Enhance Recreational Opportunities in this RP III/EA. Implementation of the preferred alternatives, noted with an asterisk, is therefore pending fund availability. Additional funds could become available to the Provide and Enhance Recreational Opportunities restoration type for various reasons (e.g., project cancellation or modification, projects under budget), at which time the AL TIG could allocate those recreational use funds to the preferred alternatives, consistent with this RP III/EA, through TIG resolution.

All ten alternatives are further evaluated under NEPA in Chapters 4 and 5 of this Draft RP III/EA.

4.0 NEPA ANALYSIS

Under NEPA (40 CFR § 1502.16), federal agencies must comparatively evaluate the environmental effects of the alternatives being considered, including but not limited to impacts on social, cultural, and economic resources, as well as natural resources. To determine whether an action has the potential to result in significant impacts, the context and intensity of the action must be considered. See 40 CFR 1508.27. For purposes of this document, impacts are characterized as minor, moderate, or major and temporary or long term. The definition of impacts is consistent with that used in the Final PDARP/PEIS, and the table from the Final PDARP/PEIS is presented in Appendix G. The analysis of beneficial impacts focuses on the duration (short term or long term), without attempting to specify the intensity of the benefit. "Adverse" is used in this chapter only to describe the federal Trustees' evaluation under NEPA. This term is defined and applied differently in consultations conducted pursuant to the Endangered Species Act (ESA) and other protected resource statutes.

This chapter provides a NEPA analysis for each Restoration Type considered for funding in this Draft RP III/EA, i.e., Provide and Enhance Recreational Opportunities and Birds. The methodology for determining impacts and the definitions of thresholds for each resource topic or area (e.g., hydrology, water quality, air quality) are described in Section 6.3.2 of the Final PDARP/PEIS and in Appendix G. For each resource area, the analysis in this chapter addresses impacts by discussing any background or methodology that is applicable to all sites. The affected environment of the Alabama coast in general can be found in Chapter 4 of the AL TIG Final RP II/EA. The analysis below provides a site-specific affected environment for each project evaluated, including the no action alternative, broken down by restoration alternative and impact topic.

4.1 RESOURCES CARRIED FORWARD AND NOT CARRIED FORWARD FOR FURTHER ANALYSIS

Certain resource areas under the Provide and Enhance Recreational Opportunities project alternatives are unaffected or minimally affected by the restoration actions being proposed for this Restoration Type. Accordingly, these resources are discussed briefly below, and only those resource areas for which potential, adverse impacts are expected are discussed in detail in this section. To avoid redundant or unnecessary information, resource areas and topics that are not expected to be affected by a proposed restoration alternative are not evaluated further under a given project. Table 4-1 notes those resources that were carried forward for further analysis under each restoration type. Where an impact topic was determined not to be carried forward for detailed analysis, the reasons for not carrying forward are noted.

Table 4-1: Issues Carried Forward and Not Carried Forward for Detailed Analysis

Resource	Provide and Enhance Recreational Opportunities	Birds
Physical Resources—Geology and Substrates	Carried forward for detailed analysis.	Projects would not include any ground-disturbing activities or otherwise create changes to substrates, geologic hazards, or geology, and no impacts would occur. Activities would focus on staffing, monitoring, research, and land conservation. Any ground disturbance that could occur during research activities would be minimal, temporary, and would not permanently alter geology or substrates or be a notable source of erosion and storm water runoff. Therefore, this resource area was not carried forward for detailed analysis.
Physical Resources—Hydrology, Water Quality, Wetlands and Floodplains	Carried forward for detailed analysis.	Projects would involve staffing, monitoring, research, and land conservation. No short- or long-term impacts on hydrology, water quality, floodplains, or wetlands would occur because of these projects. Therefore, this resource area was not carried forward for detailed analysis.
Physical Resources—Air Quality and Green House Gases	Projects would involve either property acquisition or minimal construction for recreational improvements such as small non-motorized boat launches, restrooms, parking, and/or signage. Implementation of these projects would not adversely affect regional air quality because the acquired properties would be held in conservation, and no timber would be harvested. Projects involving construction would be mostly limited to small recreational improvements or repairs of existing facilities and are not anticipated to provide a substantial contribution to local or regional air pollution. Therefore, this resource was not carried forward for detailed analysis.	Projects would include staffing, monitoring, research, and land conservation. Some motorized vehicles may be used for these activities, but their use would be short term and temporary, resulting in short-term, negligible, adverse impacts. Because these activities would be limited to staffing, monitoring, and data collection and analysis, no long-term, adverse impacts on air quality are anticipated. Therefore, this resource area was not carried forward for detailed analysis.
Physical Resources—Noise	All proposed projects would involve either property acquisition or construction for recreational improvements, including small non-motorized boat launches, restrooms, parking, and/or signage. Although temporary, localized effects on soundscapes would occur as the result of construction activities and may provide annoyance to people in the area during construction operations, the long-term character of the existing soundscape would remain the same. Therefore, no substantial noise impacts would occur from implementing the projects, and this resource area was not carried forward for detailed analysis.	Projects would include staffing, monitoring, research, and land conservation, and no long-term, adverse impacts on noise production are anticipated. Therefore, this resource area was not carried forward for detailed analysis.

Resource	Provide and Enhance Recreational Opportunities	Birds
Biological Resources—Habitats, Wildlife, and Marine and Estuarine Resources	Carried forward for detailed analysis.	Birds and bird habitat have been carried forward for detailed analysis. For all other species, projects would focus on staffing, monitoring, research, and land conservation. Land conservation could improve and enhance habitats, but no long-term, adverse impacts are anticipated. For marine and estuarine resources, impacts beyond negligible are not anticipated. Therefore this resource area was not carried forward for detailed analysis.
Biological Resources—Rare and Protected Species	Carried forward for detailed analysis.	Carried forward for detailed analysis.
Biological Resources—Federally Managed Fisheries	Carried forward for detailed analysis.	Projects would have no direct impacts on federally managed fisheries because the actions under these projects would focus on staffing, monitoring, research, and land conservation and would not involve in-water work. Because no in-water work would be conducted, projects related to this Restoration Type would result in no destruction or adverse modification to Fisheries Management Plan species or Essential Fish Habitat. Therefore, this resource area was not carried forward for detailed analysis.
Socioeconomic Resources—Cultural Resources	Carried forward for detailed analysis.	Carried forward for detailed analysis.
Socioeconomic Resources—Socioeconomics and Environmental Justice	Project areas are either undeveloped and under private ownership or established public recreational facilities. The acquisition or improvements to public access would result in minor, direct, long-term economic benefits from passive recreation and possibly indirect, long-term, beneficial economic benefits in supporting the construction industry or recreation- and tourism-related businesses during implementation. Short-term economic benefits would be minimal because no substantial construction would occur. Therefore, this resource area was not carried forward for detailed analysis.	Implementation of projects may result in very small, short-term, beneficial economic impacts on local employment during project implementation. In the long term, no economic impacts would occur from implementing the proposed projects. Therefore, this resource area was not carried forward for detailed analysis.
Socioeconomic Resources—Tourism and Recreation	Carried forward for detailed analysis.	Carried forward for detailed analysis.

Resource	Provide and Enhance Recreational Opportunities	Birds
Socioeconomic Resources—Aesthetics and Visual Resources	Carried forward for detailed analysis.	None of the activities proposed would alter the existing aesthetic or visual resources in the area over the long term. Those properties purchased for conservation of bird species would not be developed in the future, resulting in long-term benefits for those properties. Therefore, this resource area was not carried forward for detailed analysis.
Socioeconomic Resources—Infrastructure and Transportation	None of the alternatives evaluated in this Draft RP III/EA would create increased demands on area infrastructure that could not be accommodated by existing infrastructure or would affect traffic and transportation in the areas. While enhancing recreational opportunities at these sites may attract more users, the proposed improvements would provide the necessary infrastructure, such as parking, to accommodate anticipated use. Where utility demand may exist, such as construction of new restrooms, it is anticipated that sufficient capacity exists at the local utility to accommodate these minor additions to the system. Therefore, this topic was not carried forward for detailed analysis.	None of the projects evaluated in the Draft RP III/EA would create increased demands on area infrastructure that could not be accommodated or would affect traffic and transportation in the areas. Therefore, this topic was not carried forward for analysis.
Socioeconomic Resources—Fisheries and Aquaculture and Marine Transportation	No commercial fishery, aquaculture, or marine transportation operations that would be affected by the proposed alternatives occur in the area. Therefore, no impacts on fisheries or aquaculture are expected, and this resource topic was not carried forward for detailed analysis.	No commercial fishery, aquaculture, or marine transportation operations that would be affected by the staffing, monitoring, and research activities proposed projects occur in the area. Therefore, impacts on fisheries or aquaculture are not expected, and this resource area was not carried forward for detailed analysis.
Socioeconomic Resources—Land and Marine Management	No adverse impacts on land and marine management are expected. The nature of these efforts would not change land use (beyond putting land into conservation) or interact with marine management. Lands that are proposed for conversion from private ownership to a public ownership with recreational use would result in changes to how that property is currently used. Impacts related to these changes are discussed under "Tourism and Recreation." During the short term, land uses could be affected by construction activities, either from a restriction of access to sites or diversions in traffic patterns. Construction for all efforts would be phased to minimize disruptions and keep impacts to short term, minor, and adverse. Therefore, this resource area was not carried forward for detailed analysis.	For projects related to the Bird Restoration Type, no impacts on land and marine management are expected. The nature of these efforts may change land ownership but would not change how land is currently being used or interact with marine management. Because there would be no short- and long-term, adverse impacts, this resource area was not carried forward for detailed analysis.

Resource	Provide and Enhance Recreational Opportunities	Birds
Socioeconomic Resources—Public Health and Safety	None of the activities proposed for projects would adversely affect public health and safety. Improvement of recreational amenities may provide beneficial impacts. Therefore this resource area was not carried forward for detailed analysis.	None of the activities proposed for projects would affect public health. Predator management activities under the Stewardship of Coastal Alabama Beach Nesting Bird Habitat project have the potential for adverse impacts related to safety. These management activities could include direct reduction, trapping, or exclusionary fencing. However, these activities would be carried out when the public is not present. Furthermore, management activities would only be executed by authorized USDA-APHIS-WS, USFWS and/or NWR staff. These actions would minimize any potential for adverse impacts. USDA Wildlife Directives would be followed.[25] Therefore this resource area was not carried forward for detailed analysis.

[25] For more information on the USDA Wildlife Directives see https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/SA_WS_Program_Directives.

4.2 INCORPORATION OF PREVIOUS NEPA ANALYSES

Through the planning process, the AL TIG considered the NEPA analysis conducted for previous phases of restoration planning, including the following documents for the projects discussed in Section 4.2:

- Final Phase IV Early Restoration Plan and Environmental Assessments
- Alabama Trustee Implementation Group Final Restoration Plan I and Environmental Impact Statement: Provide and Enhance Recreational Opportunities
- Alabama Trustee Implementation Group Final Restoration Plan II and Environmental Assessment: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds; and Oysters
- Bon Secour National Wildlife Refuge, Comprehensive Conservation Plan

The locations and actions for the projects discussed below have been previously analyzed. The following sections discuss how these previous analyses have been incorporated by reference.

4.2.1 Perdido River Land Acquisition (Molpus Tract)

Under this alternative, ADCNR would (1) acquire and permanently conserve 1,391 acres of coastal habitat, (2) construct appropriate infrastructure to create recreational canoe/kayak access and opportunities on the Perdido River, and (3) conduct ecological restoration at the site. For further project details, see Section 2.6.1. See also, AL TIG Final RP II/EA, p. 2–45; 3–65. Under this Draft RP III/EA, the project site being considered is the same as that evaluated under the AL TIG Final RP II/EA. Therefore, the affected environment for this project would be the same as described in the AL TIG Final RP II/EA and is incorporated here by reference. For a detailed description of the affected environment for the Molpus Tract, please refer to Chapter 4.0: NEPA Affected Environment—Coastal Alabama Overview of the AL TIG Final RP II/EA. A brief summary of the affected environment and associated environmental consequences is provided below.

4.2.1.1 Affected Environment Summary

The Molpus Tract is a privately owned, undeveloped area covering more than 4 miles of riverfront land on the Perdido River, in Baldwin County (AL TIG Final RP II/EA, p. 2-45). The site is located approximately 15 miles upstream of Perdido Bay. The Perdido River is a blackwater river that creates the border between Alabama and Florida and creates Perdido Bay before flowing into the Gulf of Mexico (AL TIG Final RP II/EA, p. 7-2). The river is also on the 2016 303(d) list of impaired waters for mercury because of atmospheric deposition (AL TIG Final RP II/EA, p. 7-2). Because of the lack of development, it is one of the few areas on the Perdido River that has not experienced severe erosion and is not used for tourism or recreation (AL TIG Final RP II/EA, pp. 7-26, 7-28). The site is dominated by palustrine-forested wetland containing cypress and Atlantic white cedar trees and is pocketed by small freshwater ponds. Approximately 686 acres are upland and 705 acres are freshwater wetland. The uplands are dominated by mixed slash and loblolly pine (AL TIG Final RP II/EA, p. 7-9). ESA-listed species that could occur on the site include gopher tortoise and wood stork. Although the project is located within the historical range of the eastern indigo snake, this species has not been seen in the state of Alabama since 1954. Therefore, this species is not likely to be present in the project area. The AL TIG Final RP II/EA included red-cockaded woodpecker as a species potentially present in the project area; however, more recent species information obtained through the USFWS's Environmental Conservation Online System (or ECOS) indicates that the current range of this species does not overlap the project area (USFWS, 2019).

Therefore, red-cockaded woodpecker is not analyzed in this Draft RP III/EA. Furthermore, no ESA-designated critical habitat, marine and estuarine resources, or federally managed fisheries are located on the tract (AL TIG Final RP II/EA, pp. 7-15, 7-17, 7-21).

4.2.1.2 Environmental Consequences Summary

The AL TIG Final RP II/EA did not propose construction because the project only involved land acquisition; however, it did consider future passive recreational opportunities and infrastructure development within the Molpus Tract, particularly the integration of the site into existing plans for a Perdido River "blueway trail" that would provide canoe and kayak camping opportunities along the river (AL TIG Final RP II/EA, p. 2-45). Eleven impact topics were evaluated in the AL TIG Final RP II/EA, and no adverse impacts were identified for the impact topics assessed. The AL TIG Final RP II/EA did identify beneficial impacts from improved water quality and habitat restoration or conservation (AL TIG Final RP II/EA, p. 7-31). The impacts discussed in the AL TIG Final RP II/EA are the same as those described for the proposed Perdido River Land Acquisition (Molpus Tract) alternative evaluated in this Draft RP III/EA, and these impacts are incorporated below by reference. The proposed Perdido River Land Acquisition (Molpus Tract) project would include some additional elements not evaluated in the Final AL TIG Final RP II/EA. These improvements, which include a proposed canoe/kayak launch, parking area improvements, and educational signage, would be designed and installed in the smallest footprint possible using low-impact, permeable materials.

Based on an analysis of the actions associated with the proposed project, short-term, minor, and adverse impacts on hydrology and water quality would occur because of the potential for increased turbidity and sedimentation involved with the installation and construction of the canoe/kayak launch and parking improvements. Short-term, minor, and adverse impacts on wildlife and rare and protected species would also occur because of the potential for increased disturbances from human noise and presence.

The AL TIG made a preliminary determination that the proposed project *may affect, but is not likely to adversely affect,* the gopher tortoise and wood stork because of the potential for disturbances during project construction. They determined that construction activities would have *no effect* on the eastern indigo snake because it is not expected to be present in the project area. However, these impacts would be greatly outweighed by the long-term benefits of conserving 1,391 acres of coastal habitat, eliminating the potential for future development. The AL TIG has shared resource information for these protected resources with USFWS and the National Marine Fisheries Service (NMFS) and has requested technical assistance with impact determinations. Once the technical assistance is complete, any necessary consultations will be initiated and completed prior to completion and approval of the Final RP III/EA.

Similar to the impacts described in the AL TIG Final RP II/EA, the project would also have beneficial impacts on tourism and recreational use and aesthetics and visual resources because of improved passive recreation and the preservation of the undeveloped character of the landscape. The impacts related to infrastructure improvements such as the canoe/kayak launch, parking improvements, and educational signage described above would be similar to those evaluated under the Laguna Cove Little Lagoon Natural Resource Protection project evaluated in the AL TIG Final RP I/EIS, incorporated here by reference.

The proposed project would not adversely affect marine and estuarine resources, federally managed fisheries, tourism and recreation, or aesthetics and visual resources. Though adverse impacts on cultural resources are not anticipated, ADCNR would initiate an archaeological resources review and

consult with the Alabama Historical Commission (AHC) once preliminary design and construction plans are available.

Overall, the project would not have impacts that exceed the PDARP/PEIS definition of long term, minor, and adverse.

4.2.2 Gulf State Park Pier Renovation

The AL TIG Final RP I/EIS considered partial construction of the Gulf State Park Lodge and an interpretive lobby within the lodge and the development of public education programs, viewing porches, beach access points, public restrooms, and other amenities. The affected environment considered in this Draft RP III/EA for the renovation of the Gulf State Park Pier is the same as that evaluated in the AL TIG Final RP I/EIS, incorporated by reference herein, because the pier site is directly adjacent to the lodge site. For a detailed description of the affected environment for Gulf State Park, please refer to Chapter 4.0: NEPA Affected Environment of the AL TIG Final RP I/EIS. A brief summary of the affected environment and associated environmental consequences is provided below.

4.2.2.1 Affected Environment Summary

Gulf State Park features 6,150 acres of protected lands, located near the city of Gulf Shores in Baldwin County, Alabama. The park is adjacent to the Gulf of Mexico and includes both white sand beaches and backcountry areas. Orange Beach is located to the east. Access to the park is provided by Alabama State Roads 182 and 135, and the park serves as a prime public beach for tourists and Baldwin County residents (AL TIG Final RP I/EIS, pp. 2-19, 4-66). No issues with water quality have been identified at the park (AL TIG Final RP I/EIS, p. 4-8). The soils of the park consist of coastal beaches made up of sandy parent material (AL TIG Final RP I/EIS, p. 4-3). Habitats include maritime forest, wetlands, dunes, bogs, and marshes, and these communities contain genera from the hickory, oak, pine, willow, beach sunflower, bog button, cattail, and tapegrass classifications (AL TIG Final RP I/EIS, pp. 4-17, 4-18). The park is located near federally managed fisheries for several species (AL TIG Final RP I/EIS, p. 4-39). ESA-listed species that could occur near the project area include the Alabama beach mouse, piping plover, red knot, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, and the West Indian manatee (AL TIG Final RP I/EIS, p. 4-26). Gulf State Park also contains designated critical habitat for Alabama beach mouse and loggerhead sea turtle (AL TIG Final RP I/EIS, p. 4-42). Cultural resources are known to occur or may potentially occur at the Gulf State Park Lodge (AL TIG Final RP I/EIS, p. 4-53).

4.2.2.2 Environmental Consequences Summary

In general, the proposed pier renovation would consist of construction activities similar to those implemented under the partial construction of the Gulf State Park Lodge and Other Amenities project evaluated in AL TIG Final RP I/EIS, but impacts would be less intense because the proposed project would not include the construction of new infrastructure. Therefore, impacts described in the AL TIG Final RP I/EIS are incorporated by reference in this Draft RP III/EA but adjusted as appropriate to account for differences in scope and scale of the projects. Under the AL TIG Final RP I/EIS, the chapter concerning environmental consequences presents the evaluation of 18 impact topics (AL TIG Final RP I/EIS, p. 5-1). The analysis suggests that while minor, adverse impacts on some resources may occur, no moderate or major, adverse impacts are anticipated (AL TIG Final RP I/EIS, p. 5-155). Similarly, adverse impacts from the proposed Gulf State Park Pier Renovation evaluated in this Draft RP III/EA would be minor because no in-water work that could affect water quality, habitat, marine or estuarine resources, and federally managed fisheries would be conducted. Most adverse impacts would occur during construction and from temporary disturbances to recreation and visual resources. These impacts are incorporated below by reference.

The Gulf State Park Pier Renovation proposed in this Draft RP III/EA would replace the entire Gulf State Park pier deck with removable materials that have more longevity than existing materials. The project would also replace the existing lighting to reduce light pollution near important sea turtle nesting grounds and the existing fish cleaning station.

Based on an analysis of the actions associated with the proposed project, short-term, minor, and adverse impacts on wildlife and rare and protected species would occur from potential disturbances associated with noise and human presence during construction. However, long-term, beneficial impacts on wildlife and rare and protected species would occur from replacing the fish cleaning station because anglers would not throw fish carcasses into open water, thereby reducing the potential for interactions with birds, sharks, and other non-target wildlife species. Replacing the current lighting with wildlife-friendly lights would have long-term, decreased impact on nesting sea turtles because disturbances associated with artificial lighting would be reduced.

The AL TIG made a preliminary determination that the proposed project *may affect, but is not likely to adversely affect,* the rare and protected species listed above because of potential disturbances associated with noise during project construction, the ongoing risk of sea turtle entanglement with fishing gear, and benefits associated with replacing the fish cleaning station and lighting upgrades. The AL TIG has shared resource information for these protected resources with USFWS and NMFS and has requested technical assistance with impact determinations. Once the technical assistance is complete, any necessary consultations will be initiated and completed prior to completion and approval of the Final RP III/EA.

Short-term, minor, and adverse impacts on tourism and recreation would also occur during the construction period because public access would be restricted. Similarly, short-term, minor, and adverse impacts on aesthetics and visual resources would occur during the construction period when the decking is removed and replaced. However, long-term, beneficial impacts on these resources would occur from improved access to natural resources and enhanced visual quality of the pier's improvements.

Water quality, habitats, marine or estuarine resources, and federally managed fisheries would not be adversely affected. Though adverse impacts on cultural resources are not anticipated, ADCNR would initiate an archaeological resources review and consult with AHC once preliminary design and construction plans are available.

Overall, the project would not have impacts that exceed the PDARP/PEIS definition of long term, minor, and adverse.

4.2.3 BSNWR Recreational Enhancement – Mobile Street Boardwalk

The Final Phase IV ERP/EAs and the AL TIG Final RP I/EIS considered recreational enhancements in or near BSNWR. These enhancements included repairing and improving trails in the BSNWR, specifically the Jeff Friend Trail, a similar project which shares the same affected environment(Final Phase IV ERP/EAs, Chapter 8, p. 1).

The affected environment considered in this Draft RP III/EA is the same as was evaluated under the Final Phase IV ERP/EAs. Therefore, the affected environment for this project would be the same as described in that document and is incorporated here by reference. For a detailed description of the affected environment for the BSNWR Recreational Enhancement – Mobile Street Boardwalk alternative, please refer to Chapter 8: Bon Secour National Wildlife Refuge Trail Enhancement Project of the Final Phase IV ERP/EAs and the BSNWR Comprehensive Conservation Plan. A brief summary of the affected environment and associated environmental consequences is provided below.

4.2.3.1 Affected Environment Summary

BSNWR consists of 7,500 acres of public land and is located in Baldwin County along Highway 180. Most of BSNWR is located on the Fort Morgan Peninsula and provides the public with more than 7 miles of trails, two beach access locations, and a kayak launch into Little Lagoon. Agricultural and industrial runoff affect water quality in the refuge (USFWS, 2005, p. 4), and soils are well-drained, sandy, and are generally covered in lichen and leaf litter (Final Phase IV ERP/EAs, Chapter 8, p. 12). Habitats in the refuge include dunes, grasslands, strand, maritime hammocks, wetlands, and tidal marshes (Final Phase IV ERP/EAs, Chapter 8, p. 17). These habitats represent some of the best remaining stopover and staging habitat for neotropical migratory songbirds (Final Phase IV ERP/EAs, Chapter 8, p. 19). The refuge also provides crucial habitat for beach nesting birds and migratory and wintering shorebirds (Final Phase IV ERP/EAs, Chapter 8, p. 19). ESA-listed species that could occur near the project area, as described in the Final Phase IV ERP/EAs (Chapter 8, p. 21), include the Alabama beach mouse, loggerhead sea turtle, green sea turtle, Kemp's ridley sea turtle, gopher tortoise, piping plover, and red knot. Other ESA-listed species that could occur in the project area include wood stork and West Indian manatee. Although the project is located within the historical range of the eastern indigo snake, this species has not been seen in the state of Alabama since 1954. BSNWR staff conducts annual trapping surveys for snakes, but no eastern indigo snakes have been observed or collected. Therefore, this species is not believed to be present in the project area. BSNWR contains designated critical habitat for Alabama beach mouse and nesting loggerhead sea turtles. Archaeological sites have been reported to exist in BSNWR (Final Phase IV ERP/EAs, Chapter 8, p. 24).

In addition to the resource topics that were incorporated by reference into the Final Phase IV ERP/EAs, wildlife (other than birds), marine and estuarine resources, and federally managed fisheries were considered. BSNWR's pristine habitats support an abundance and diversity of wildlife taxa (in addition to resident and migratory birds), including mammals, reptiles, amphibians. Common mammals include various species of shrews and mice, eastern chipmunk, coyote, bobcat, long-tailed weasel, red and gray fox, nine-banded armadillo, eastern cottontail rabbit, raccoon, striped skunk, white-tailed deer, hispid cotton rat, eastern woodrat, fox squirrel, and southern flying squirrel. Common reptiles include garter snake, green tree snake, black racer, eastern kingsnake, rat snake, brown water snake, cottonmouth, green anole, brown anole, common five-lined skink, eastern fence lizard, broadhead skink, ground skink and common box turtle. Amphibians include cricket frog, northern spring peeper, green tree frog, eastern spadefoot, eastern narrow-mouthed toad, and southern toad.

Marine and estuarine habitats in the Gulf of Mexico and Little Lagoon support many marine estuarine finfish species, as well as crabs, shrimp, and other shellfish. Salt marshes in the project area may also provide nursery habitat for early life stages of offshore finfish species. Soft-bottom benthic habitats in the project area support a variety of burrowing benthic invertebrates, including mollusks and polychaetes.

Appendix H provides a list of the species that are managed by the Gulf of Mexico Fishery Management Council and NOAA NMFS, under Fishery Management Plans in coastal Alabama. Marine and estuarine habitats within BSNWR support many of the managed species listed in Appendix H. Waters adjacent to the project area also contain Essential Fish Habitat (EFH) for shrimp, red drum, reef fishes, coastal migratory pelagics, and various life stages of several highly migratory species.

4.2.3.2 Environmental Consequences Summary

The Final Phase IV ERP/EAs evaluated ten impact topics for the BSNWR Trail Enhancement Project. The analysis suggests that construction activities would cause local short-term, minor, and adverse impacts on most resources (e.g., noise, air quality, soils, land management, and infrastructure). Short-term,

minor to moderate, adverse impacts could occur on tourism and recreation and aesthetics and visual resources from temporary trail closures and viewshed changes during construction (Final Phase IV ERP/EAs, p. 394-395). However, long-term benefits are anticipated for those resources after construction is complete (Final Phase IV ERP/EAs, Chapter 8, p. 39). The proposed construction would not adversely affect habitats but could benefit habitats by keeping visitors on the trail. Guided nature walks that educate the public on the importance of the habitats and other natural resources found within the BSNWR would be conducted on the Jeff Friend Trail (Final Phase IV ERP/EAs, Chapter 8, p. 9). Similar impacts would be applicable to the proposed BSNWR Recreational Enhancement – Mobile Street Boardwalk alternative under this Draft RP III/EA, and these impacts are incorporated by reference below.

The BSNWR Recreational Enhancement – Mobile Street Boardwalk alternative proposed under this Draft RP III/EA would replace or repair public boardwalks and trailhead parking lots at BSNWR and enhance directional and informational signage to facilitate public use. The proposed project would be consistent with the BSNWR's Comprehensive Conservation Plan and its visitor use objectives. The wooden boardwalks near Mobile Street would be replaced with composite material. Access and erosion issues in the public parking lot near the Mobile Street boardwalk would also be addressed.

Based on an analysis of the actions associated with the proposed project, short-term, minor, and adverse impacts would occur on water quality and habitats, and short-term, minor to moderate, and adverse impacts would occur on rare and protected species from construction activities (e.g., paving) and associated noise. Because of the deep sand and flat terrain, there is little potential for compaction or erosion. Work would occur outside the bird nesting season. Because shorebirds and wading birds use the wet beach immediately adjacent to the project area and supratidal zone for loafing, they may be flushed from the work area particularly as construction nears the open sand beach. These effects are expected to be short term (days) and not result in longer-term changes in use by shorebirds or wading birds. Disturbances associated with project construction could also result in temporary disruption of other behaviors, including foraging and staging during migration. The noise generated from construction and the presence of humans could also disturb other wildlife species in adjacent habitats, resulting in short-term, minor, and adverse impacts on wildlife, including resident and migratory birds.

The AL TIG made a preliminary determination that the proposed project *may affect, but is not likely to adversely affect,* the gopher tortoise, piping plover, red knot, and wood stork because of the potential for disturbances during project construction. The also determined that construction activities would have *no effect* on the eastern indigo snake because it is not expected to occur in the project area. In addition, the proposed project would have *no effect* on the sea turtles in coastal waters (green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle), West Indian manatee, or gulf sturgeon because the project would not require any in-water work. The proposed project *may affect, but is not likely to adversely affect,* nesting loggerhead, green, or Kemp's ridley sea turtles because construction would occur outside sea turtle nesting season (October–February). In the unlikely event that a sea turtle nest is present in the area during construction activities, appropriate measures would be taken to avoid or minimize potential impacts on nests and hatchlings. The Mobile Street boardwalk is located within Alabama beach mouse critical habitat, and the AL TIG determined that replacement of the boardwalk *may affect, and is likely to adversely affect,* the Alabama beach mouse as a result of noise and other disturbances during construction. However, appropriate measures would be taken to avoid or minimize adverse impacts to the extent possible, including conducting pre-construction surveys and avoiding work during the night when Alabama beach mice are active. Because the proposed project would replace an existing boardwalk and use mitigative measures to avoid and minimize potential adverse impacts, Alabama beach mouse or loggerhead sea turtle critical

habitat would not be damaged or adversely modified. The AL TIG has shared resource information for these protected resources with USFWS and NMFS and has requested technical assistance with impact determinations. Once the technical assistance is complete, any necessary consultations will be initiated and completed prior to completion and approval of the Final RP III/EA.

Similarly, short-term, minor, and adverse impacts on tourism and recreation and aesthetics and visual resources would occur during the construction period because public access would be restricted, and the boardwalk and trail would be temporarily removed from use. However, long-term benefits on these resources are anticipated once construction is complete because the project would promote enhanced access to the scenic resources within BSNWR. The project would not affect marine and estuarine resources or federally managed fisheries because no in-water work would occur.

ADCNR would initiate an archaeological resources review and consult with AHC once preliminary design and construction plans are available. Because of the historically sensitive nature of BSNWR, , an archaeological survey would be completed, in consultation with AHC, before any construction activities are undertaken.

Overall, the project would not have impacts that exceed the PDARP/PEIS definition of long term, minor, and adverse.

4.2.4 BSNWR Recreational Enhancement – Centennial Trail Boardwalk

The Final Phase IV ERP/EAs and the AL TIG Final RP I/EIS considered recreational enhancements in or near the BSNWR. These enhancements included repairing and improving trails in the BSNWR (Final Phase IV ERP/EAs, Chapter 8, p. 1). A brief summary of the affected environment and associated environmental consequences from those documents is provided in Sections 4.2.3.1, Affected Environment Summary, and Section 4.2.3.2, Environment Consequences Summary, above for the BSNWR Recreational Enhancement – Mobile Street Boardwalk alternative. However, unlike the BSNWR Recreational Enhancement – Mobile Street Boardwalk alternative, no elements of the BSNWR Recreational Enhancement – Centennial Trail Boardwalk alternative would occur within designated critical habitat for Alabama beach mouse or nesting loggerhead sea turtles.

4.2.4.1 Affected Environment Summary

The affected environment considered in this Draft RP III/EA is the same as that evaluated in the Final Phase IV ERP/EAs and summarized above in Section 4.2.3.1, Affected Environment Summary. Therefore, the affected environment for this project would be the same as described in these documents. For a detailed description of the affected environment for the BSNWR Recreational Enhancement – Centennial Trail Boardwalk alternative, please refer to Chapter 8: Bon Secour National Wildlife Refuge Trail Enhancement Project of the Final Phase IV ERP/EAs and the BSNWR Comprehensive Conservation Plan.

4.2.4.2 Environmental Consequences Summary

Under the Final Phase IV ERP/EAs, ten impact topics were evaluated for the BSNWR Trail Enhancement Project. The analysis suggests that impacts on most resources would be local short-term, minor, adverse impacts from construction activities. Similar impacts would be applicable to the proposed BSNWR Recreational Enhancement – Centennial Trail Boardwalk alternative under this Draft RP III/EA, and are further described above in Section 4.2.3.2, Environment Consequences Summary.

The BSNWR Recreational Enhancement – Centennial Trail Boardwalk alternative proposed under this Draft RP III/EA would replace or repair public boardwalks and trailhead parking lots at the BSNWR and enhance directional and informational signage to facilitate public use. Based on an analysis of the

actions associated with the proposed project, short-term, minor, and adverse impacts on water quality, habitats, wildlife, and rare and protected species would occur from construction activities (e.g., paving) and associated noise.

The AL TIG made preliminary determinations that the proposed project *may affect, but is not likely to adversely affect,* the Alabama beach mouse, gopher tortoise, piping plover, red knot, and wood stork because of the potential for disturbances during project construction. Construction activities would have *no effect* on the eastern indigo snake because it is not expected to occur in the project area. In addition, the proposed project would have *no effect* on the sea turtles in coastal waters (green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle), West Indian manatee, or gulf sturgeon because the project would not require any in-water work. The proposed project would have *no effect* on nesting loggerhead, green, or Kemp's ridley sea turtles because no construction would occur within sea turtle nesting habitat. If this project were to become a preferred alternative and be selected for implementation, the AL TIG would share resource information for these protected resources with USFWS and NMFS and request technical assistance with impact determinations. Once the technical assistance was complete, any necessary consultations would be initiated and completed prior to completion and approval of the Final RP III/EA. Short-term, minor, and adverse impacts on tourism and recreation and aesthetics and visual resources would occur during the construction period because public access would be restricted and the boardwalk and trail would be temporarily removed from use. However, long-term benefits on these resources are anticipated once construction is complete because the project would promote enhanced access to the scenic resources within BSNWR. The project would not affect marine and estuarine resources or federally managed fisheries because no in-water work would occur.

4.3 PROVIDE AND ENHANCE RECREATIONAL OPPORTUNITIES

4.3.1 Bayfront Park Restoration and Improvement Phase IIa and IIb

4.3.1.1 Physical Environment: Geology and Substrates – Affected Environment

Bayfront Park largely contains high-salinity soils and non-saline complex soils. The high-salinity soils are very poorly drained and have a high frequency of ponding and flooding. The complex soils are somewhat poorly drained and have no frequency of ponding or flooding (USDA, 2017). The project area contains unconsolidated shores that are characterized by less than 75 percent areal cover of stones (USDA, 2017).

4.3.1.2 Physical Environment: Geology and Substrates – Environmental Consequences

Alternatives evaluated may include new construction, soil excavation, utility installation, and other environmental modifications that would disturb geology and substrates. Areas where these activities would occur are noted below. These alterations may result in short- and long-term, geologic- and soil-related impacts at the alternative sites. These impacts could be both adverse and beneficial. Adverse impacts would involve temporary and minor increased sedimentation and erosion, while beneficial geologic- and soil-related impacts would include decreased sedimentation and erosion and shoreline hardening. Applicable sediment control measures and BMPs are discussed in detail in the AL TIG RP II/EA Section 8.1.2 (p. 8-3) and would also apply to the actions proposed in this Draft RP III/EA.

Construction would take place over a 24-month period and would be completed in accordance with all applicable local, state, federal, and coastal compliance requirements. There would be an increase in disturbed areas associated with the stabilization and construction of a sand pocket beach, civil works improvements (crushed aggregate access roads, concrete parking pads and sidewalks for ADA access, concrete apron at park entry, and beach overlooks), and construction of parking, a new pavilion, and

restrooms. The stabilization and construction of the sand pocket beach would permanently affect the geology and substrates in the area. The sand pocket beach, breakwaters, and groins would be constructed in front of existing riprap, and sand nourishment would be brought in from outside the project area. This design and construction methodology would help stabilize the soils and substrates in the area of potential impact and minimize adverse impacts on geology, substrates, and other resources. The parking area would be reconfigured and the size would increase; however, the parking area would be constructed using a low-impact design. Additionally, the existing restroom would be replaced with a new restroom, and a new pavilion would be added to the playground equipment. These improvements would have no impact on substrates because they would occur on a previously disturbed area. Erosion control BMPs would be followed to protect adjacent water resources. Overall, the stabilization of the sand pocket beach, civil works improvements, and parking improvements would have indirect, beneficial impacts on this project area by decreasing erosion and sedimentation.

4.3.1.3 Physical Environment: Hydrology, Water Quality, Floodplains, and Wetlands – Affected Environment

Hydrology. Bayfront Park is located on the western shore of Mobile Bay. Mobile Bay is approximately 32 miles long and 23 miles across with an average depth of 10 feet. Winds and tides deliver Gulf waters from the south, and the Mobile-Tensaw River Delta delivers freshwater from the north. A single daily diurnal tidal cycle influences the bay, with a tide change averaging less than a foot to 2.5 feet (Handley et al., n.d.).

Water Quality. Mobile Bay was listed on the Alabama Department of Environmental Management (ADEM) 2014 303(d) list of impaired waters because of pathogens caused by urban runoff and storm sewers; however, after the implementation of management and monitoring plans and volunteer programs, it was removed from the 2018 303(d) list of impaired waters, and overall water quality has improved (ADEM, 2016b; ADEM, 2018; MBNEP, 2019). The salinity of the water in the bay is highly variable because of freshwater runoff into the bay, salt water input from the Gulf, and evaporation as a result of the shallow nature of the bay (Handley et al., n.d.).

Floodplains. Bayfront Park is at an elevation of 9 feet. This site is within the Federal Emergency Management Agency (FEMA)-designated 100-year floodplain with a designation of Zone VE, coastal flood zone velocity (wave action) hazard (FEMA, 2017).

Wetlands. About one-half of Bayfront Park's approximately 20 acres are wetlands and are classified as estuarine and intertidal that are emergent, persistent, and irregularly flooded. This area consists of deepwater tidal habitats and adjacent tidal wetlands that are dominated by herbaceous hydrophytes. Substrates in these habitats are exposed to tides but flood less than daily (USFWS, 2017a).

4.3.1.4 Physical Environment: Hydrology, Water Quality, Floodplains, and Wetland – Environmental Consequences

Hydrology. The undertaking for Bayfront Park Restoration and Improvement Phase IIa and IIb would involve two new components and two replacement projects. The replacement projects would not affect hydrology because the footprints for the sites would not change. The two new projects would create a sand pocket beach along the shoreline and develop accessible roads and pathways for visitors. Creating a sand pocket beach would involve dumping and moving sand along the coastline and installing breakwaters and groins if advised by a coastal engineer. These activities would not have any long-term impacts on hydrology. Developing accessible roads and pathways for visitors would involve creating crushed aggregate access roads, installing accessible concrete parking pads and sidewalks, installing a concrete apron at the park entry, and building small beach overlooks along the shore. These activities

would have minor, short-term impacts on hydrology from grading by heavy machinery that would compact portions of the substrate and increase runoff in the project area.

The installation of additional parking, accessible roads, and pathways may have a long-term, minor, adverse impact on hydrology where new substrates are not permeable (concrete sidewalks and pads) and stormwater runoff is increased. Where impermeable materials are installed, efforts would be taken to ensure proper drainage along the sidewalks and concrete pads. Beach lookouts would be installed on pilings and would not affect the hydrology of the project site. While runoff around new concrete installments would increase, hydrology would benefit from the installation of the sand pocket beach, which would be placed along the shoreline, just east of the riprap storm wall. The placement of sand, breakwaters, and groins in front of the storm wall would decrease the surge of the waves against the armored shore. By decreasing the power of the incoming waves, shore protection and resiliency would be enhanced. With a sandy coastline, hydrologic processes against the riprap would more closely mimic natural hydrologic processes. The installation of a pocket beach would have long-term, beneficial impacts on hydrology.

Water Quality. Water quality would experience temporary, minor, adverse impacts from the heavy machinery and ground-disturbing activities used to improve and construct new park facilities and amenities. These impacts could potentially include increased siltation and turbidity during the construction process. The creation of a sand pocket beach would involve adding sand to a 10-acre area along the shore and using machinery to shape the new beach, which would have short-term, minor, adverse impacts on seawater from increased sediment and siltation during the construction process. The installation of impermeable pathways and concrete pads for parking would result in long-term, minor, adverse impacts on water quality by slightly decreasing filtration through the wetland and increasing polluted stormwater runoff. However, the creation of a sand pocket beach would provide habitat for native plants and organisms along the coastline that act as natural water filtration systems. Therefore, adding a pocket beach would have long-term, beneficial impacts on the water quality in Mobile Bay by providing habitat for filter feeders that improve water quality.

Floodplains. Minor grading would occur for the construction of park facilities, including an increase in disturbed area associated with the park entrance, access road improvements, and parking area reconfiguration. The floodplain would be compacted in these areas during the construction process resulting in short-term, minor, adverse impacts on floodplains. The creation of a sand pocket beach would occur in the bay and would not affect the floodplain. Over the long term, the addition of the pathways and amenities would not change the floodplain designation, and no adverse impacts on the floodplain are expected as a result of this portion of the project. The addition of a sand pocket beach would slightly extend the floodplain into the bay where the beach remains out of the water. Because the sandy beach would decrease the momentum of waves crashing into the shoreline, the floodplain along the shore would become more resilient. Therefore, long-term, beneficial impacts on floodplains are expected as a result of the implementation of this portion of the project.

Wetlands. Construction of a sand pocket beach with groins and breakwaters would have permanent, minor, adverse impacts on wetlands because sand would be placed in designated estuarine intertidal wetland habitat. However, the sand would be placed on existing riprap, which provides little to no benefit to wetland function. Temporary direct and indirect, minor, adverse impacts would occur from temporary increases in turbidity in adjacent waters during beach construction. Temporary, minor, adverse impacts on wetlands would occur during the construction process of this project from heavy machinery disturbance in a designated wetland area. Areas that would receive new concrete pads, sidewalks, and roads would need to be graded and filled. However, the park improvements were designed to be low-impact, and efforts would be taken to localize adverse impacts by providing

designated access roads for machinery and silt fencing. Installation of impermeable sidewalks and amenities would have long-term, minor, adverse impacts on wetlands by increasing runoff and disrupting the natural wetland hydrologic processes around those areas. The pocket beach would have long-term, beneficial impacts on wetlands by providing increased protection against erosion from storm surges.

4.3.1.5 Biological Resources: Habitats – Affected Environment

Numerous habitats are present along the Alabama coast and in this specific project area, including submerged aquatic habitats, intertidal marshes, beaches and dunes, maritime forests , floodplain forests, wet pine savanna, near-coast pine flatwoods, and upland forest. A general description of each of these habitat types is provided in the AL TIG Final RP II/EA, Section 4.2.1 (pp. 4-6 to 4-9). Specifically at the Bayfront Park project site is an approximately 20-acre park with public access to the Mobile Bay shoreline and other public amenities, such as a playground, picnic areas, and restrooms. The habitats found in the park largely consist of salt and brackish tidal marsh, developed open space, and pine flatwoods. Table 4-2 shows the habitat types in the park by percentage of land cover. The salt and brackish tidal marshes receive regular daily tidal water and are typically dominated by smooth cordgrass (*Spartina alterniflora*) and needlegrass rush (*Juncus roemerianus*). Overstory vegetation in the project area is characterized by longleaf pine and, to a lesser degree, by slash pine.

Table 4-2: Habitat Types in Bayfront Park

Habitat Type	Percent
Savanna and Wet Prairie	3.6%
Salt and Brackish Tidal Marsh	38.6%
Undifferentiated Barren Land	4.4%
Near-Coast Pine Flatwoods	15.3%
Developed, Open Space	37.3%
Developed, Low Intensity	0.8%
TOTAL	**100.0%**

Source: United States Geological Survey, 2011

4.3.1.6 Biological Resources: Habitats – Environmental Consequences

The project would construct a 10-acre sand pocket beach, update and replace playground equipment with a new pavilion, complete civil work such as a crushed aggregate access road, and construct new restroom facilities. The project would also replace and expand existing boardwalks and overlooks and add additional crushed aggregate and concrete walkways and concrete for ADA parking. Approximately 43 percent of the park is developed or barren land that has been previously disturbed. The low-impact design of the new development would limit disturbance to the extent practicable; however, improvements to the park entrance, access road, and parking areas would increase disturbance to the pine flatwoods habitat. The construction of a 10-acre sand pocket beach with groins and breakwaters would disturb the brackish tidal marsh and savanna wet prairie habitats along Mobile Bay. Therefore, the project is expected to have moderate, long-term, adverse impacts on local habitats.

4.3.1.7 Biological Resources: Wildlife – Affected Environment

Mammals. Mammal species would be limited to those adapted to disturbances including habitat fragmentation, development, and frequent nearby human presence and noise. Common species include striped skunk, eastern cottontail rabbit, raccoon, white-tailed deer, nine-banded armadillo, nutria, gray and red foxes, squirrels, chipmunks, bats, and mice and other small rodents.

Reptiles. Reptile species could include common box turtle, eastern glass lizard, common five-lined skink, and green anole, black racer, rat snake, eastern watersnake, and cottonmouth.

Amphibians. Amphibian species would be limited at Bayfront Park because the park does not contain any constant freshwater sources. Species could include cricket frog, northern spring peeper, green tree frog, eastern spadefoot, eastern narrow-mouthed toad, and southern toad.

Birds. Bayfront Park contains limited habitat for year-round nesting birds, but may provide stopover habitat for birds crossing the Gulf of Mexico during seasonal migrations given its close proximity to Dauphin Island. Common passerine species at Bayfront Park could include finches, warblers, sparrows, and buntings. The Mobile Bay shoreline provides foraging habitat for wading birds, including herons and egrets. Common raptor species could include osprey and bald eagle. Shorebirds and water birds, including pelicans, gulls, terns, and skimmers are also common in the project area.

4.3.1.8 Biological Resources: Wildlife – Environmental Consequences

Construction of a sand pocket beach would result in direct and indirect, short-term, adverse impacts on aquatic wildlife from temporary increases in turbidity in adjacent Mobile Bay waters. Erosion control BMPs would limit this impact. Placement of sand on existing riprap would result in mortality of some encrusting invertebrate species, such as oyster, mussels, and barnacles, due to burial. Because riprap does not provide high quality habitat for most wildlife species, these impacts, although long term and adverse, would not be detrimental to the overall ecological community. Constructing a 10-acre sand pocket beach, replacing and expanding existing boardwalks and overlooks, adding additional walkways, updating and replacing playground equipment with a new pavilion, completing civil work such as a crushed aggregate access road, and constructing new restroom facilities would result in temporary disturbances to terrestrial wildlife species related to noise during implementation. The small amount of habitat that would be lost as a result of these activities would not likely have a measurable effect on wildlife because they would be located in previously disturbed areas. The low-impact design of the new development would further limit disturbances to wildlife over the long term.

Similarly, noise and the presence of construction equipment and crews necessary for improvements to the park entrance, access road, walkways, and parking areas would temporarily disturb wildlife, but impacts would not be noticeable over the long term because the majority of the project area has been previously disturbed. Species that may occur in the project area are accustomed to frequent nearby human presence and noise from the existing high levels of visitor use. Overall the project is expected to have direct and indirect, short- and long-term, minor, adverse impacts on wildlife.

4.3.1.9 Biological Resources: Marine and Estuarine Resources – Affected Environment

Marine and estuarine fauna include commercially and recreationally harvested finfish and shellfish species such as shrimp, crabs, oysters, and other benthic invertebrates. A description of common coastal Alabama marine and estuarine resources that may occur are provided in the AL TIG Final RP II/EA Section 4.2.3 (pp. 4-15 to 4-16). Bayfront Park is located adjacent to Mobile Bay, and its estuarine open water and salt marsh habitats support many estuarine finfish species, as well as crabs, shrimp, and other shellfish. Salt marshes in the project area may also provide nursery habitat for early life stages of offshore finfish species. The project area does not contain oyster reefs, although they are present

nearby in Mobile Bay and Mississippi Sound. Riprap, which currently protects the shoreline of Bayfront Park, provides habitat for encrusting organisms such as barnacles and mussels. Soft-bottom benthic habitat adjacent to the park supports a variety of burrowing benthic invertebrates, including mollusks and polychaetes.

4.3.1.10 Biological Resources: Marine and Estuarine Resources – Environmental Consequences

Construction of a sand pocket beach with groins and breakwaters would have direct and indirect, short-term, adverse impacts on marine and estuarine resources from temporary increases in turbidity in adjacent waters. Placing sand on existing riprap would disturb habitat for encrusting invertebrate species, such as oyster, mussels, and barnacles. These impacts, although long term and adverse, would not be detrimental to the overall marine or estuarine habitat because they would be localized. On the contrary, conversion of riprap to sand beach habitat would provide new habitat for burrowing invertebrate species, resulting in long-term, beneficial impacts on these species. Constructing a 10-acre sand pocket beach, updating and replacing playground equipment with a new pavilion, completing civil work such as a crushed aggregate access road, and constructing new restroom facilities could result in temporary disturbances to adjacent estuarine habitats from noise during construction. Similarly, improvements to the park entrance, access road, and parking areas would temporarily disturb species in nearby habitats, but impacts would not be noticeable over the long term. Species that may occur in the project area are accustomed to frequent human presence and noise as from the current high levels of visitor use. Overall the project is expected to have direct and indirect, short- and long-term, minor, adverse impacts on marine and estuarine resources.

4.3.1.11 Biological Resources: Rare and Protected Species—Affected Environment

A number of species listed as endangered or threatened under the ESA occur in coastal Alabama and may be present in the project areas (see Appendix H). The project areas may also harbor species that are federally protected under the ESA, Marine Mammal Protection Act, Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act. The Alabama Regulations on Game and Fish and Fur Bearing Animals also provide state-level protection for some additional species (Alabama Administrative Code r. 220-1-1 et seq.) (ADCNR, 2019).

ESA-listed species that are known to occur or may occur at Bayfront Park include:

- **West Indian manatee**: present in Mobile Bay
- **Gulf sturgeon:** present in Mobile Bay

Bayfront Park does not contain designated critical habitat for ESA-listed species. Dolphins are common in southern Mobile Bay and Mississippi Sound and may be present near the Bayfront Park shoreline on occasion. Other state-protected and rare species that could occur in the project area include but are not limited to bald eagle, northern harrier, and reddish egret.

4.3.1.12 Biological Resources: Rare and Protected Species – Environmental Consequences

Impacts on rare and protected species as a result of the Bayfront Park Restoration and Improvement Phase IIa and IIb project would be similar to those described for wildlife. Stabilization and construction of a sand pocket beach could have direct and indirect, short-term, adverse impacts on the ESA-listed gulf sturgeon and West Indian manatee from temporary increases in turbidity in adjacent Mobile Bay waters. Erosion control BMPs and the implementation of standard practices for in-water work would limit this impact. Therefore, the AL TIG made a preliminary determination that the project *may affect, but is not likely to adversely affect,* gulf sturgeon and West Indian manatee. The AL TIG has shared resource information for these protected resources with USFWS and NMFS and has requested technical

assistance with impact determinations. Once the technical assistance is complete, any necessary consultations will be initiated and completed prior to completion and approval of the Final RP III/EA. Potential impacts on dolphins would be the same as those described for gulf sturgeon and West Indian manatee. Constructing a 10-acre sand pocket beach, updating and replacing playground equipment with a new pavilion, completing civil work such as a crushed aggregate access road, and constructing new restroom facilities would result in temporary disturbances to other state-protected and rare species, including bald eagle, northern harrier, and reddish egret from noise and the presence of construction equipment. The low-impact design of the new development would further limit disturbances to these species over the long term. Overall, the project is expected to have direct and indirect, short- and long-term, minor, adverse impacts on rare and protected species.

4.3.1.13 Biological Resources: Federally Managed Fisheries – Affected Environment

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), which was first passed in 1976, is the primary law governing marine fisheries management in federal waters of the United States. In general, the Magnuson-Stevens Act seeks to foster long-term biological and economic sustainability of the nation's marine fisheries within 200 nautical miles of the nation's coasts (NOAA, 2019b). Alabama's coastal waters provide habitat for commercially important species, including spotted sea trout, striped mullet, southern flounder, Atlantic croaker, and Gulf menhaden, as well as their prey. Appendix H provides a list of the species that are managed by the Gulf of Mexico Fishery Management Council and NOAA NMFS, under Fishery Management Plans in coastal Alabama. The Magnuson-Stevens Act also includes provisions for the protection of EFH, which is defined as, "those waters and substrates necessary for fish to spawn, breed, feed, or grow to maturity." Any federal agency that takes an action that could adversely affect EFH by reducing the quantity or quality of habitat must work with NOAA NMFS to identify impacts and steps for conserving the habitat and reducing the impact of the action (NOAA, 2019b). NMFS has identified EFH habitats for the Gulf of Mexico in its Fisheries Management Plan Amendments.

The project area is located on the western shore of Mobile Bay, just north of the Mississippi Sound. The waters of Mobile Bay and Mississippi Sound include many of the managed fish species listed in Appendix H. Waters immediately adjacent to the project area contain EFH for shrimp, red drum, reef fishes, and coastal migratory pelagics, and various life stages of several highly migratory species.

4.3.1.14 Biological Resources: Federally Managed Fisheries – Environmental Consequences

Placing material on unconsolidated soft-bottom benthic habitat to construct the breakwater structures would permanently convert one type of benthic habitat to another and would temporarily create some turbidity in water column. Placing sand on existing riprap to construct a 10-acre pocket beach would also increase turbidity in the project area and in down-current portions of western Mobile Bay. However, increased turbidity would be mostly limited to the construction period, and turbidity would return to baseline once sediments stabilize. Modeling would be used to ensure that the project is designed to prevent long-term, adverse impacts on adjacent shorelines or increase sediment transport. Erosion control BMPs would be implemented to avoid adverse impacts on adjacent fish habitats as a result construction and demolition activities in upland portions of the project area. Overall, the project would have direct and indirect, short-term, minor, adverse impacts on federally managed fisheries and EFH.

4.3.1.15 Socioeconomic Resources: Cultural Resources – Affected Environment

The Alabama Gulf Coast is one of the most historically significant regions of the South. It was popular with prehistoric Native Americans for fishing and food gathering long before the first European explorers arrived on the coast (Cox, 2012). Coordination with AHC regarding the extent and nature of

cultural resources at all of the locations under consideration in this Draft RP III/EA is ongoing. This information is not available at this time but will be included in the Final RP III/EA.

4.3.1.16 Socioeconomic Resources: Cultural Resources – Environmental Consequences

This project's proposed actions would be minimally invasive in locales that have largely been previously disturbed. No additional infrastructure or building construction would be associated with the project beyond that which is described herein. As noted above, low-impact design would be included in the plans where feasible, and the construction contractor would be required to use best practices and appropriate equipment for demolition and construction. The current project would remove an existing restroom. All proposed work would be conducted in accordance with applicable local, state, federal, and coastal compliance requirements. To ensure there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places [NRHP]), ADCNR would initiate an archaeological records review and consultation with AHC once preliminary design and construction plans are available. Appropriate actions would be undertaken as required as a result of this records review and consultation. cultural, historical and/or archeological resources were discovered during any project activities, all restoration activities would cease, and ADCNR and AHC would be immediately notified. No additional restoration activities would occur until cleared by ADCNR and AHC.

4.3.1.17 Socioeconomic Resources: Tourism and Recreation – Affected Environment

The roughly 20-acre Bayfront Park is located on Dauphin Island Parkway near the Town of Alabama Port. Bayfront Park receives more than 300 visitors on the weekends and more than 1,200 visitors per week during the peak summer months. Recreational activities include covered picnic areas, fishing, kayaking, bird watching, and wildlife observation. A user survey conducted in February 2019 indicates that visitors feel the park is well-maintained, but the facilities are old and in need of upgrades.

4.3.1.18 Socioeconomic Resources: Tourism and Recreation – Environmental Consequences

The construction of park amenity improvements at Bayfront Park would not have long-term, adverse impacts on tourism and recreation. Site-specific improvements would occur over a 24-month period and would involve stabilizing and constructing a sand pocket beach, expanding the boardwalk, completing civil works improvements such as creating a crushed aggregate access road, updating restroom facilities, and updating playground equipment with a new picnic pavilion. During the construction period, public access to these amenities would be restricted, resulting in short-term, minor impacts on tourism and recreation. However, once the improvements are complete, these enhanced recreational amenities would serve visitors. Overall, this would result in long-term benefits on tourism and recreation at Bayfront Park by providing improved access to recreation in southern Mobile County.

4.3.1.19 Socioeconomic Resources: Aesthetics and Visual Resources – Affected Environment

The landscape of Bayfront Park consists of tidal marsh, developed open space, and forest. Infrastructure in the park includes an unpaved road, a boardwalk, picnic shelters and benches, playground structures, grills, and a building. Scenic views of Mobile Bay are available along the entire shore of the park. The park is located adjacent to a segment of Alabama's Coastal Connection Scenic Byway, which follows State Highway 193/Dauphin Island Parkway from Dauphin Island to Alabama Port before continuing westward on State Highway 188 (Alabama's Coastal Connection Scenic Byway, 2019).

4.3.1.20 Socioeconomic Resources: Aesthetic and Visual Resources – Environmental Consequences

The proposed construction of several park amenity improvements would not result in long-term, adverse impacts on the visual character of the site. These developments would be partially visible from

the segment of Alabama's Coastal Connection Scenic Byway, which follows State Highway 193/Dauphin Island Parkway to the west of the project site. However, they would not attract attention, dominate the view, or detract from current visitor activities or experiences along the scenic byway. Proposed improvements would include stabilizing and constructing a sand pocket beach, expanding the boardwalk, completing civil work such as a crushed aggregate access road, updating the restroom facilities, and updating playground equipment with a new picnic pavilion. Over the construction period, these site-specific improvements would require that visitors be restricted from certain areas of the park but would not significantly affect the visual character of the site or detract from views of the surrounding tidal marsh, forest, or Mobile Bay. These impacts would be temporary and would cease once construction is complete. Once complete, the proposed improvements would promote enhanced access to a scenic resource. Overall, long-term, beneficial impacts on aesthetics and visual resources are anticipated as a result of the project.

4.3.2 Bayfront Park Restoration and Improvement Phase IIa

The affected environment for the Bayfront Park Restoration and Improvement Phase IIa project is the same as described above in Section 4.3.1, Bayfront Park Restoration and Improvement Phase IIa and IIb. The section below therefore addresses just the environmental consequences for this project.

4.3.2.1 Physical Environment: Geology and Substrates – Environmental Consequences

Construction is expected to take place over an 18-month period and would be completed in accordance with all applicable local, state, federal, and coastal compliance requirements. Construction of the civil work, playground, sand pocket beach, and restroom facilities would have localized adverse impacts on the geology and substrates in the area during construction. Overall, the civil works improvements and construction of the sand pocket beach with breakwaters and groins would have indirect, beneficial impacts on the project area by decreasing erosion and sedimentation. Erosion control BMPs would be followed to protect adjacent water resources.

4.3.2.2 Physical Environment: Hydrology, Water Quality, Floodplains, and Wetland – Environmental Consequences

Impacts related to hydrology, water quality, floodplains, and wetlands would be the same as described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative.

4.3.2.3 Biological Resources: Habitats – Environmental Consequences

Impacts on habitats would be the same as described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative, except there would be no impacts associated with replacing and expanding existing boardwalks and overlooks or adding additional walkways and a portion of the ADA parking because these improvements would not be constructed. Overall, the project is expected to have moderate, long-term, adverse impacts on local habitats.

4.3.2.4 Biological Resources: Wildlife – Environmental Consequences

Impacts on wildlife would be the same as those described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative, except there would be no impacts associated with replacing and expanding existing boardwalks and overlooks or adding additional walkways and a portion of the ADA parking because these improvements would not be constructed. Overall, the project is expected to have direct and indirect, short- and long-term, minor, adverse impacts on wildlife. The decrease in light pollution would decrease the long-term, adverse impacts on wildlife.

4.3.2.5 Biological Resources: Marine and Estuarine Resources – Environmental Consequences

Impacts on marine and estuarine resources would be the same as described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative, except there would be no potential for impacts associated with replacing and expanding existing boardwalks and overlooks or adding additional walkways and a portion of the ADA parking because these improvements would not be constructed. Overall, the project would result in direct and indirect, short-term, minor, adverse impacts on marine and estuarine resources.

4.3.2.6 Biological Resources: Rare and Protected Species – Environmental Consequences

Impacts on rare and protected species would be the same as described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative, except no impacts would be associated with replacing and expanding existing boardwalks and overlooks or adding additional walkways and a portion of the ADA parking because these improvements would not be constructed. The AL TIG made a preliminary determination that the project *may affect, but is not likely to adversely affect,* gulf sturgeon and West Indian manatee. If this project were to become a preferred alternative and be selected for implementation, the AL TIG would share resource information for these protected resources with USFWS and NMFS and request technical assistance with impact determinations. Once the technical assistance were complete, any necessary consultations would be initiated and completed prior to completion and approval of the Final RP III/EA. Overall, the project is expected to have short- and long-term, minor, adverse impacts on rare and protected species. The decrease in light pollution long-term would reduce adverse impacts on rare and protected species.

4.3.2.7 Biological Resources: Federally Managed Fisheries – Environmental Consequences

Impacts on federally managed fisheries that occur in the project area would be the same as those described above for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative.

4.3.2.8 Socioeconomic Resources: Cultural Resources – Environmental Consequences

Information regarding cultural resources is the same as described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative.

4.3.2.9 Socioeconomic Resources: Tourism and Recreation – Environmental Consequences

Impacts on tourism and recreation would be the same as those described above for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative, except replacing and expanding existing boardwalks and overlooks or adding additional walkways and a portion of the ADA parking would not occur. Overall, impacts on tourism and recreation would be beneficial over the long term.

4.3.2.10 Socioeconomic Resources: Aesthetic and Visual Resources – Environmental Consequences

Impacts on aesthetics and visual resources would be the same as described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative, except replacing and expanding existing boardwalks and overlooks or adding additional walkways and ADA parking would not occur.

4.3.3 Perdido Beach Public Access Coastal Protection

As noted in section 2.6.5, hydrographic modeling would be completed as part of this project and would inform project design. Should that design change any of the key assumptions used in this analysis, additional compliance activities would occur before project implementation.

4.3.3.1 Physical Environment: Geology and Substrates – Affected Environment

This project is located on loamy fine sand, with a 0 to 5 percent slope. This sand is somewhat excessively drained, with no frequency of flooding or ponding, and was formed from sandy marine deposits derived from sedimentary rock (USDA, 2017).

4.3.3.2 Physical Environment: Geology and Substrates – Environmental Consequences

Construction would occur over a period of 4 to 5 months, in accordance with all applicable local, state, federal, and coastal compliance requirements. All work, except plantings and sand nourishment, would be completed by water access, so sediment in the area would not be affected. Sand would be hauled in and placed on existing sediment; however, because the area already consists of beaches with sand and coarse sand, sand nourishment would not affect sediment. Further, dump trucks would use existing roadways and would not drive on the sand. An excavator would be used to spread new sand in areas where sand previously existed but has eroded. Over the long term, this project would have beneficial impacts on the area by preventing future erosion and stabilizing the area through the installation of native vegetation and breakwaters, thereby improving the quality of the substrates.

4.3.3.3 Physical Environment: Hydrology, Water Quality, Floodplains, and Wetlands – Affected Environment

Hydrology. Perdido Beach is located along Perdido Bay. The bay covers approximately 130 square kilometers and is fed by 3,238-square-kilometer Perdido watershed that contains tributaries, lagoons, and bayous. This project is located in the Middle Perdido Bay, which extends southwest from Cummings Point to Innerarity Point.

Water Quality. Although Perdido Bay is not listed on Alabama's 2018 303(d) list of impaired waters, water quality of this area can change rapidly. This bay is fed by multiple upstream tributaries, which are influenced by wastewater, paper mill effluent, nonpoint sources such as agricultural and silvicultural runoff, and development (Kirschenfeld et al., 2006). Additionally, the salinity of the water is subject to rapid change due to evaporation and freshwater dilution from the land (USFWS, 2017a).

Floodplains. This project is located adjacent to Bayou Aloe and is within the FEMA-designated 100-year floodplain with a designation of Zone AE, at an elevation of 6 feet (FEMA, 2017).

Wetlands. Perdido Beach is classified as estuarine, intertidal, emergent, and persistent and irregularly flooded. This area consists of deepwater tidal habitats and adjacent tidal wetlands that are dominated by herbaceous hydrophytes. Substrates in these habitats are exposed to tides, but flood less than daily (USFWS, 2017a).

4.3.3.4 Physical Environment: Hydrology, Water Quality, Floodplains, and Wetland – Environmental Consequences

Hydrology. Construction of the living shoreline, beaches, and breakwaters would not involve grading or hardening the shoreline; therefore, short-term impacts on hydrology are not expected. Wetland plants would be installed along the shoreline to provide a buffer between the bay and the beach to prevent scouring. The plantings would stabilize the substrate and protect against erosion. Breakwaters would be installed 180 feet off the coast and would reduce storm surges and decrease the risk of erosion along the shoreline. Planting native, estuarine vegetation and installing breakwaters for storm surge mitigation would enhance resiliency along the shoreline and allow natural hydrologic processes to be restored. As a result, the project would have long-term, beneficial impacts on hydrology.

Water Quality. Short-term, minor, adverse impacts on water quality would occur during project construction and implementation. All work would be completed by barges except for the plantings and

sand nourishment, which would be delivered by truck. The limestone for the breakwaters would be transported by barge. The installation of the 300-foot breakwaters would temporarily disrupt sediment on the seafloor and increase turbidity during the construction process. The installation of breakwaters and native plantings would reduce wave energy, which would reduce scouring, erosion, and sedimentation and have a long-term, beneficial impact on water quality in this area.

Floodplains. Construction would replenish sands along the shoreline where they have been eroded and would not fill the floodplain; therefore, the project would not change the floodplain level. No short-term impacts on floodplains would occur from the implementation of this project. The installation of a living shoreline and breakwaters would improve the resiliency of the shoreline and mitigate erosion, resulting in long-term, beneficial impacts on floodplains.

Wetlands. Short-term, minor, adverse impacts on wetlands would occur during the delivery of sand and plantings, which would be delivered by truck in a designated wetland area. This disturbance would cease when the construction period has ended, and the disturbed areas would recover naturally. Sand would be placed in areas where sand previously existed but has eroded. All permitting and consultation requirements would be completed prior to project construction. Over the long term, the native plantings and breakwaters would have beneficial impacts on wetlands. The implementation of this project would protect shoreline wetlands against erosion. Erosion mitigation would result in the retention of substrates and native vegetation within the floodplain, improving filtration and restoring natural, hydrologic wetland regimes.

4.3.3.5 Biological Resources: Habitats – Affected Environment

As noted in Section 4.3.1.5, numerous habitat types are found in coastal Alabama. For this specific project site, the project area contains approximately 2 acres of unconsolidated shore (i.e., gravel or sand that lacks vegetation). Low and medium intensity development exists northwest of the shore, while open salt water exists southeast of the shore.

4.3.3.6 Biological Resources: Habitats – Environmental Consequences

This project would install 611 linear feet of breakwater and lay 1,005 cubic yards of sand to restore, renourish, and protect the beach shore that was lost to the last three storms. Installation of the breakwater riprap and placement of sand would require the use of a barge, crane, roll-off containers, and other motorized equipment, which would have minor, short-term, adverse impacts on the unconsolidated shore and open salt water habitats, including submerged aquatic vegetation. These impacts include compaction of on-site soils, increased turbidity, increased sedimentation, vegetative damage or disturbance, and the potential for chemical run-off from construction equipment. Placement of breakwaters would permanently convert soft bottom benthic habitat to hard bottom habitat within the footprint of the breakwater and result in long-term, minor, adverse and beneficial impacts. The installation of native wetland and upland vegetation in the project area would stabilize soils and provide additional habitat. Once construction is complete, breakwaters would reduce erosion by sheltering the shoreline, resulting in moderate, long-term, beneficial impacts on local habitats.

4.3.3.7 Biological Resources: Wildlife – Affected Environment

Mammals. Mammal species likely to occur in the project area include raccoon, gray and red fox, mice and other small rodents.

Reptiles. The project area is in a heavily developed coastal residential area, and therefore provides limited habitat for most terrestrial reptile species. However, reptile species that could occur in the project area include common five-lined skink, green anole, eastern glass lizard, black racer, and rat

snake. Marine reptiles that could occur in the project area, including sea turtles, are discussed below under Rare and Protected Species.

Amphibians. The project area does not contain suitable habitat for amphibians.

Birds. Birds in the vicinity of the proposed project consist mostly of passerines but may also include shorebirds, terns, gulls, and raptors. This includes both resident and migratory birds that use the project area for feeding or resting.

4.3.3.8 Biological Resources: Wildlife – Environmental Consequences

The placement of breakwaters and beach nourishment could have direct and indirect, short-term, minor, adverse impacts on wildlife because of the noise produced during construction. Most mammals and birds would likely avoid the area during project implementation. Temporary increases in turbidity in Perdido Bay would likely result in short-term, minor, adverse impacts on aquatic species. However, turbidity levels would likely return to baseline once the breakwaters were installed. Restoration of the eroding beach from placement of breakwaters, beach nourishment, and shoreline planting, would result in long-term, beneficial impacts on most terrestrial wildlife species because their habitat would be enhanced. Overall the project is expected to have direct and indirect, short-term, minor, adverse and long-term, beneficial impacts on wildlife.

4.3.3.9 Biological Resources: Marine and Estuarine Resources – Affected Environment

Marine open water and sandy benthic habitats in the project area support numerous estuarine and marine finfish species, crabs, shrimp, and various benthic invertebrates including polychaetes and mollusks.

4.3.3.10 Biological Resources: Marine and Estuarine Resources – Environmental Consequences

Placement of breakwaters and beach nourishment would temporarily increase turbidity in Perdido Bay, resulting in short-term, minor, adverse impacts on marine and estuarine resources. However, turbidity levels would likely return to baseline once the breakwaters were installed. Mobile species would likely avoid the area during project implementation, to the degree possible. Placement of breakwaters would permanently convert soft bottom benthic habitat to hard bottom habitat within the footprint of the 611-linear-foot breakwater, resulting in long-term, minor, adverse impacts for some benthic species such as polychaetes and burrowing bivalves, and long-term, beneficial impacts on species that benefit from hard structures, such as oysters, mussels, barnacles, crabs, and many species of finfish. Overall, the project would result in direct, short-term, minor, adverse and long-term, adverse and beneficial impacts on marine and estuarine resources.

4.3.3.11 Biological Resources: Rare and Protected Species – Affected Environment

A number of species listed as endangered or threatened under the ESA occur in coastal Alabama and may be present in the project areas (see Appendix H). ESA-listed species that are known to occur or may occur in the project area include:

- **Green sea turtle:** present in Alabama coastal waters and could occur in Perdido Bay on occasion; the project area does not provided suitable sea turtle nesting habitat
- **Hawksbill sea turtle:** present in Alabama coastal waters and could occur in Perdido Bay on occasion
- **Kemp's ridley sea turtle:** present in Alabama coastal waters and could occur in Perdido Bay on occasion; the project area does not provided suitable sea turtle nesting habitat

- **Leatherback sea turtle:** present in Alabama coastal waters and could occur in Perdido Bay on occasion
- **Loggerhead sea turtle:** present in Alabama coastal waters and could occur in Perdido Bay on occasion; the project area does not provided suitable sea turtle nesting habitat
- **West Indian manatee:** present in all Alabama coastal waters and likely to be present near the project area on occasion
- **Gulf sturgeon:** potentially present in Perdido Bay

The project area does not contain designated critical habitat for ESA-listed species. Dolphins are common in Alabama coastal waters and are likely to be frequently present in the project area. Other state-protected and rare species that could occur in the project area include but are not limited to American oystercatcher, snowy plover, Wilson's plover, and reddish egret.

4.3.3.12 Biological Resources: Rare and Protected Species – Environmental Consequences

Placement of breakwaters and beach nourishment could have direct and indirect, short-term, adverse impacts on the ESA-listed gulf sturgeon and West Indian manatee from noise associated with construction equipment and temporary increases in turbidity in Perdido Bay. Most individuals would likely avoid the area during project implementation. Temporary increases in turbidity could also result in indirect, short-term, adverse impacts on green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle, which could be present in Perdido Bay on occasion. However, turbidity levels would likely return to baseline once the breakwaters were installed. The project would not affect nesting sea turtles because the project area does not provide suitable nesting habitat. Therefore, the AL TIG made a preliminary determination that the project *may affect, but is not likely to adversely affect,* gulf sturgeon, West Indian manatee, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle. Potential impacts on dolphins would be the same as those described for gulf sturgeon, West Indian manatee, and sea turtles. The AL TIG has shared resource information for these protected resources with USFWS and NMFS and has requested technical assistance with impact determinations. Once the technical assistance is complete, any necessary consultations will be initiated and completed prior to completion and approval of the Final RP III/EA.

Noise and increased human presence during project implementation could result in temporary disturbances to other state-protected and rare species, including American oystercatcher, snowy plover, Wilson's plover, and reddish egret. Any displaced individuals would likely relocate to other nearby habitats. Restoration of eroding beach habitat from placement of breakwaters, beach nourishment, and shoreline planting would have long-term, beneficial impacts on these species because foraging and loafing habitat would be enhanced. Overall the project is expected to have direct and indirect, short-term, minor, adverse and long-term, beneficial impacts on rare and protected species.

4.3.3.13 Biological Resources: Federally Managed Fisheries – Affected Environment

The project area is located in Perdido Bay and contains many of the managed fish species listed in Appendix H. The project area also contains EFH for shrimp, red drum, reef fishes, coastal migratory pelagics, and various life stages of several highly migratory species.

4.3.3.14 Biological Resources: Federally Managed Fisheries – Environmental Consequences

The placement of breakwaters and beach nourishment would temporarily increase turbidity in Perdido Bay, resulting in short-term, minor, adverse impacts on federally managed fish species and EFH. However, turbidity levels would likely return to baseline once the breakwaters were installed. Mobile

species would likely avoid the area during project implementation. Placement of breakwaters would permanently convert soft bottom benthic habitat to hard bottom habitat within the footprint of the 611-linear-foot breakwater. However, this would not likely alter or reduce the overall functionality of EFH in Perdido Bay. The breakwater structures may provide habitat for some federally managed fish. Overall, the project is expected to have direct, short-term, minor, adverse and long-term, beneficial impacts on federally managed fisheries and EFH.

4.3.3.15 Socioeconomic Resources: Cultural Resources – Affected Environment

The Alabama Gulf Coast is one of the most historically significant regions of the South. It was popular with prehistoric Native Americans for fishing and food gathering long before the first European explorers arrived on the coast (Cox, 2012). Coordination with the AHC regarding the extent and nature of cultural resources at all of the locations under consideration in this Draft RP III/EA is ongoing. This information is not available at this time but will be included in the Final RP III/EA. This project area has two areas of public access to the water. Coastal storms and surges and residential hardening of the seawall adjacent to the public access points have removed a large amount of sand from the public access, leaving little to no beaches for the public to enjoy. There are no prehistoric or historic districts, sites, buildings, structures, or objects located in the project area.

4.3.3.16 Socioeconomic Resources: Cultural Resources – Environmental Consequences

This project would fund implementation and construction of shoreline improvements and protection. The project's proposed actions would be minimally invasive in locales that have largely been previously disturbed. No additional infrastructure or building construction would be associated with the project beyond that which is described herein. Based on these project activities, there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP). If cultural, historical and/or archeological resources were discovered during any project activities, all restoration activities would cease, and ADCNR and AHC would be immediately notified. No additional restoration activities would occur until cleared by ADCNR and AHC.

4.3.3.17 Socioeconomic Resources: Tourism and Recreation – Affected Environment

Existing public beach access in the Town of Perdido Beach is provided at the end of Escambia and Mobile Avenues. Relatively limited public tourism and recreational uses in this area include opportunities for swimming, boating, fishing, and sightseeing. A public boat ramp owned by Baldwin County is located in the town (Norton, 2017). Numerous private boat launches exist at other locations in the Town of Perdido Beach.

4.3.3.18 Socioeconomic Resources: Tourism and Recreation – Environmental Consequences

The proposed enhancements of the public beach located in the Town of Perdido Beach would not have long-term, adverse impacts on tourism and recreation. Site-specific improvements would occur over a 4- to 5-month period and would involve installing 611 linear feet of riprap, 12 sections of breakwaters, native wetland plants, and beach sand replenishment. During the construction period, public access to the beach would be restricted, resulting in short-term, minor impacts on tourism and recreation. Once the improvements are complete, visitors would be served by enhancements to the beach, which would include better protection from erosion because of the placement of breakwaters and increased access from sand replenishment. Furthermore, new wetlands along seawalls would act as a nursery for fish and provide educational opportunities for the public. Overall, this alternative would have long-term benefits on tourism and recreation at Perdido Beach.

4.3.3.19 Socioeconomic Resources: Aesthetics and Visual Resources – Affected Environment

The general landscape of Perdido Beach is characterized by beach sand and open salt water southeast of the shore. Infrastructure near Perdido Beach consists of private residential development amid intermittent forest. Numerous private homes exist along the shoreline of Perdido Bay, with small pockets of white sandy beach occurring between numerous stone breakwaters that extend into the bay.

4.3.3.20 Socioeconomic Resources: Aesthetic and Visual Resources – Environmental Consequences

Proposed enhancements of Perdido Beach would affect its visual character during the short-term construction period but would have beneficial effects on visual character over the long term. During the construction period, the presence of construction equipment and emissions of dust and particulates associated with truck delivery of sand for beach nourishment and barge delivery of limestone rock for breakwaters would detract from the surrounding visual character and scenery. Impacts on aesthetics and visual resources would be short term and adverse. Once complete, however, the proposed improvements would promote enhanced public access to scenic resources in Perdido Bay. Overall, long-term, beneficial impacts on aesthetics and visual resources are anticipated from the project.

4.3.4 No Action Alternative – Provide and Enhance Recreational Opportunities

4.3.4.1 Physical Environment: Geology and Soils – Environmental Consequences

Under the no action alternative, projects related to geology and soils would not occur; properties being considered for acquisition to enhance recreational opportunities could remain undeveloped or could be developed in a number of ways; and improvements at existing recreational areas, such as Bayfront Park, Gulf State Park, and BSNWR, would not occur. If properties being considered for acquisition remained in their current condition and no enhancements were made to existing recreational areas, the state of geology and soils would remain the same. Areas such as Bayfront Park and Perdido Beach would continue to see erosion and potential loss of public beach areas. If properties being considered for acquisition were developed for other uses, there would likely be minor to major, adverse impacts on soils because the projects would modify land use through future development and construction, which could increase erosion.

4.3.4.2 Physical Environment: Hydrology, Water Quality, Floodplains, and Wetland – Environmental Consequences

Under the no action alternative, projects related to recreational use would not occur. Additionally, parcels being considered for purchase to preserve habitat could remain undeveloped, or they could be developed for commercial and/or residential use. If properties were acquired for preservation, impacts would be similar to those described for the action alternatives. However, if the properties were developed, there would be short- and long-term, adverse impacts on hydrology, water quality, floodplains, and wetlands because the development of infrastructure (e.g., parking lots or buildings) would disturb soil and compact the earth during construction and increase runoff and infiltration during this period. In the long term, development of the parcels would increase the amount of impervious surfaces in the area, increasing runoff and decreasing infiltration. The level of adverse impacts would be directly related to the intensity and type of development, it were to occur.

4.3.4.3 Biological Resources: Habitats – Environmental Consequences

Under the no action alternative, projects related to the goal of providing and enhancing recreational opportunities would not occur; properties being considered for acquisition to enhance recreational opportunities could remain undeveloped or could be developed in a number of ways; and improvements at existing recreational areas, such as Bayfront Park, Gulf State Park, and BSNWR, would

not occur. Where wildlife-friendly lighting is proposed, this would not occur, and light pollution would not decrease, resulting in long-term, moderate adverse impacts. If properties being considered for acquisition remained in their current condition and no enhancements were made to existing recreational areas, there would be no resulting impact on existing habitat. If properties being considered for acquisition were developed for other uses, there would likely be minor to major, adverse impacts on habitats because the projects would modify land use through future development.

4.3.4.4 Biological Resources: Wildlife – Environmental Consequences

Under the no action alternative, projects related to the goal of providing and enhancing recreational opportunities would not occur; properties being considered for acquisition to enhance recreational opportunities could remain undeveloped or could be developed in a number of ways; and improvements at existing recreational areas, such as Bayfront Park, Gulf State Park and BSNWR, would not occur. Where wildlife-friendly lighting is proposed, this would not occur, and light pollution would not decrease, resulting in long-term, moderate adverse impacts. If properties being considered for acquisition remained in their current condition and no enhancements were made to existing recreational areas, there would be no resulting impact on wildlife. If properties being considered for acquisition were developed for other uses, there would likely be minor to major, adverse impacts on wildlife because the projects would modify wildlife habitat through future development.

4.3.4.5 Biological Resources: Marine and Estuarine – Environmental Consequences

Under the no action alternative, projects related to the goal of providing and enhancing recreational opportunities would not occur; properties being considered for acquisition to enhance recreational opportunities could remain undeveloped or could be developed in a number of ways; and improvements at existing recreational areas, such as Bayfront Park, Gulf State Park and BSNWR, would not occur. If properties being considered for acquisition remained in their current condition and no enhancements were made to existing recreational areas, there would be no beneficial impacts on existing marine or estuarine resources. If properties being considered for acquisition were developed for other uses, there would likely be minor to major, adverse impacts on marine and estuarine resources because the projects would modify land use through future development near these resources.

4.3.4.6 Biological Resources: Rare and Protected Species – Environmental Consequences

Under the no action alternative, projects related to the goal of providing and enhancing recreational opportunities would not occur; properties being considered for acquisition to enhance recreational opportunities could remain undeveloped or could be developed in a number of ways; and improvements at existing recreational areas, such as Bayfront Park, Gulf State Park, and BSNWR, would not occur. If properties being considered for acquisition remained in their current condition and no enhancements were made to existing recreational areas, rare and protected species would not be affected. If properties being considered for acquisition were developed for other uses, impacts on rare and protected species would likely be minor to major and adverse, if habitats are altered or lost through future development.

4.3.4.7 Biological Resources: Federally Managed Fisheries – Environmental Consequences

Under the no action alternative, projects related to the goal of providing and enhancing recreational opportunities would not occur; properties being considered for acquisition to enhance recreational opportunities could remain undeveloped or could be developed in a number of ways; and improvements at existing recreational areas, such as Bayfront Park, Gulf State Park and BSNWR, would not occur. If properties being considered for acquisition remained in their current condition and no enhancements were made to existing recreational areas, there would be no resulting impact on existing

federally managed fisheries or EFH. If properties being considered for acquisition were developed for other uses, there would likely be minor to major, adverse impacts on federally managed fisheries or EFH because the projects would modify land use through future development near these resources.

4.3.4.8 Socioeconomic Resources: Cultural Resources – Environmental Consequences

Under the no action alternative, projects related to the goal of providing and enhancing recreational opportunities would not occur. It is not known if these properties would otherwise be developed, but if they were, any potential cultural resources on the site could be disturbed. If left undeveloped, cultural resources would not be affected.

4.3.4.9 Socioeconomic Resources: Tourism and Recreation – Environmental Consequences

Under the no action alternative, projects related to the goal of providing and enhancing recreational opportunities would not occur. If properties being considered for acquisition remained in their current condition and no enhancements were made to existing recreational areas, there would be no resulting beneficial impact on tourism and recreational use. If properties being considered for acquisition were developed for other uses, there would likely be minor impacts on tourism and recreation because these sites could restrict public access with future development. Similarly, if improvements at existing recreational areas were not undertaken and these public amenities were allowed to deteriorate further, there would likely be moderate, adverse impacts on tourism and recreation because closures to protect public safety could result in potential visitors choosing to pursue activities in other available local or regional areas.

4.3.4.10 Socioeconomic Resources: Aesthetics and Visual Resources – Environmental Consequences

Under the no action alternative, projects related to the goal of providing and enhancing recreational opportunities would not occur. If properties being considered for acquisition remained in their current undeveloped condition, there would be no resulting beneficial impact on aesthetics and visual resources. If developed, there would likely be minor to moderate impacts on aesthetics and visual resources because further development on the properties would change the visual landscape, with the level of impact related to the intensity of development. Similarly, if improvements at existing recreational areas were not undertaken and these public amenities were allowed to deteriorate further, there would likely be moderate, adverse impacts on aesthetics and visual resources because the deteriorated condition of these public amenities would be readily apparent and attract attention. Although such conditions would not dominate the viewscape, they could detract from the current user activities or experiences.

4.4 BIRDS

4.4.1 Stewardship of Coastal Alabama Beach Nesting Bird Habitat

4.4.1.1 Biological Resources: Birds – Affected Environment

The State of Alabama funded the Alabama Coastal Bird Stewardship Program via funding from the NFWF GEBF, which works to improve the status of bird species of conservation concern by training volunteers to steward and monitor targeted and other species and their habitat at key nesting sites in the state. This project would expand on this work in coastal Alabama by reducing human disturbance to and predation of nests and chicks of coastal nesting bird species injured by the DWH oil spill, thereby potentially increasing productivity of those species. The program would consist of five components that would work together to reduce stressors that affect coastal bird populations and provide information to support future restoration decision-making: conduct stewardship activities to reduce human disturbances that contribute to nest failure; conduct targeted, coordinated predator management

activities; conduct monitoring in support of adaptive management at project sites to determine nesting and fledging success; deploy decoys; and conduct habitat and nesting area enhancements. Targeted species for predator management activities would be determined in coordination with USDA and may include coyote, red fox, and others that predate on adults and fledglings, as well as those that scavenge nests and feed on eggs. Stewardship activities could occur at nesting sites in coastal and nearshore habitats anywhere along the Alabama coast. Therefore, the affected environment for the proposed Stewardship of Coastal Alabama Beach Nesting Bird Habitat project includes the entire Alabama Gulf coast. For a detailed description of Alabama coastal habitats that comprise this affected environment, please refer to Chapter 4.0: NEPA Affected Environment—Coastal Alabama Overview of the AL TIG Final RP II/EA.

4.4.1.2 Biological Resources: Birds – Environmental Consequences

Under this project, stewardship activities would increase public awareness of coastal Alabama bird species, potentially reducing human disturbances that contribute to nest failure. Erecting symbolic fencing to reduce human disturbance prior to the start of nesting season could increase nesting success for birds at target sites identified by project implementors, ADCNR, and USFWS. Deployment of decoys would lower the risk of human disturbance and nest predation by attracting target species to suitable habitat areas where such disturbances are less likely to occur. Predator management activities would reduce predation by coyote and red fox, which would lead to increased reproductive success for target species. Enhancement of nesting habitat area in Lower Perdido Islands would increase the size of a current least tern nesting area by removing vegetation and installing/distributing shell hash. These activities would have direct and indirect, short- and long-term, beneficial impacts on birds by reducing human disturbances and predation and creating additional nesting habitat, potentially leading to enhanced nesting success. USDA would implement predator management in accordance with its Mammal Damage Management in Alabama EA (USDA, 2014). Predator management activities would include the use of exclusionary fencing but could also include trapping or lethal removal methods (USDA, 2014). A site-specific analysis would be performed at every location where predator management would occur to develop the most appropriate strategy at each location, as described in the Mammal Damage Management in Alabama EA (USDA, 2014). Predator management techniques that could be implemented could have unintended temporary disturbances on waterbirds, raptors, and passerines from noise and habitat intrusion (USDA, 2014). However, the potential for such impacts would be minimal and should not affect the overall populations of any non-target wildlife species (USDA, 2014). Monitoring at critical nesting sites to determine nesting success of target species could result in indirect, long-term, beneficial impacts to birds by informing future conservation efforts aimed at enhancing nesting success. Overall, the project would have direct and indirect, short- and long-term, beneficial impacts on birds.

4.4.1.3 Biological Resources: Rare and Protected Species – Affected Environment

ESA-listed bird species that are a focus of the Audubon Coastal Bird Survey, as identified in Section 2.7.1, include:

- **Piping plover:** known to occur seasonally on Alabama beaches and coastal flats
- **Red knot:** known to occur seasonally on Alabama beaches and coastal flats
- **Green sea turtle:** known to nest on Alabama beaches
- **Kemp's ridley sea turtle:** known to nest on Alabama beaches
- **Loggerhead sea turtle:** known to nest on Alabama beaches

Critical wintering habitat for piping plover has been designated at several locations in coastal Alabama, including Dauphin Island, Isle Aux Herbes (Coffee Island), and the western portion of the Fort Morgan Peninsula. Critical nesting habitat for loggerhead sea turtle has been designated along most Gulf-facing beaches in Baldwin County. Other state-protected and rare species that are a focus of the Audubon Coastal Bird Survey include American oystercatcher, snowy plover, Wilson's plover, and reddish egret.

4.4.1.4 Biological Resources: Rare and Protected Species – Environmental Consequences

Impacts on rare and protected species as a result of the project would be the same as described above under Wildlife (birds). Stewardship and predator management activities would also result in short- and long-term, beneficial impacts on birds by reducing human disturbances and predation. As noted above under Wildlife (birds), USDA would implement predator management in accordance with its Mammal Damage Management in Alabama EA (USDA, 2014). Although predator management activities could have unintended adverse impacts on non-target wildlife species, including rare and protected species, USDA would incorporate techniques to minimize these risks (USDA, 2014). Therefore, as noted in the Mammal Damage Management in Alabama EA, these methods are not likely to result in adverse impacts on any rare or protected species (USDA, 2014). A site-specific analysis would be performed at every location where predator management would occur to develop the most appropriate strategy at each location, as described in the Mammal Damage Management in Alabama EA (USDA, 2014). Monitoring at critical nesting sites and collecting data to determine nesting success could result in long-term, beneficial impacts on birds by informing future conservation efforts aimed at enhancing nesting success.

ESA-listed bird species that would benefit from the project include piping plover and red knot. Therefore, the AL TIG made a preliminary determination that the project *may affect, but would not be likely to adversely affect,* these species. Green, Kemp's ridley, and loggerhead sea turtles are known to nest on Alabama beaches and could be present in areas where project activities would occur. Nesting sea turtles could be temporarily disturbed by increased human presence during stewardship activities. However, every effort would be made to avoid disturbances to nesting sea turtles. Hatchlings would not likely be affected because stewardship activities would be conducted during the day, while hatchlings typically emerge at night. Predator management may result in long-term, beneficial impacts on nesting sea turtles because removal of predators, including but not limited to coyote and red fox, would decrease the likelihood of nest predation. Therefore, the AL TIG made a preliminary determination that the project *may affect, but would not be likely to adversely affect* nesting sea turtles. Similarly, it determined that the project would result in *no damage or adverse modification* to piping plover or loggerhead sea turtle critical habitat. The AL TIG has shared resource information for these protected resources with USFWS and NMFS and has requested technical assistance with impact determinations. Once the technical assistance is complete, any necessary consultations will be initiated and completed prior to completion and approval of the Final RP III/EA. State-listed and rare species that would benefit from the project include American oystercatcher, snowy plover, Wilson's plover, and reddish egret. Overall, the project would result in short- and long-term, beneficial impacts on rare and protected species.

4.4.1.5 Socioeconomic Resources: Cultural Resources – Affected Environment

The Alabama Gulf Coast is one of the most historically significant regions of the South. It was popular with prehistoric Native Americans for fishing and food gathering long before the first European explorers arrived on the coast (Cox, 2012). Coordination with the AHC regarding the extent and nature of cultural resources at all of the locations under consideration in this Draft RP III/EA is ongoing. This information is not available at this time but will be included in the Final RP III/EA.

4.4.1.6 Socioeconomic Resources: Cultural Resources – Environmental Consequences

If cultural, historic, and/or archeological resources were discovered during any project activities, all restoration activities would cease and ADCNR and AHC would be immediately notified. No additional restoration activities would take place until cleared by ADCNR and AHC.

This project would involve monitoring, outreach, and education activities with the public regarding the vulnerable beach nesting birds in Mobile and Baldwin counties. This work would ultimately lead to increased nest success lands in the project area. This project's actions are non-invasive, and no infrastructure or building construction would be associated with the project. This project's actions would be both non-invasive and very minimally invasive from the installation of symbolic (temporary post and rope) and/or exclusionary fencing around nesting areas prior to the start of the nesting season to reduce human ingress and disturbance. No infrastructure or construction would be associated with the project beyond the temporary fencing/barriers described herein. As such there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP).

4.4.1.7 Socioeconomic Resources: Tourism and Recreation – Affected Environment

The affected environment for the Alabama Coastal Bird Stewardship Program includes myriad tourism and recreational opportunities located on Alabama's Gulf Coast, which boasts white sand beaches adjacent to turquoise waters. Numerous tourism and recreational opportunities are available for visitors to enjoy the natural resources present in the area. The main attraction of the Gulf Coast of Alabama is the beach, which provides tourists and recreational visitors with opportunities for sightseeing and bird watching, among other forms of passive and active recreation, as it contains habitat for the diverse array of birds using the project area—including seabirds, shorebirds, and raptors—that are found across the Alabama coastline.

4.4.1.8 Socioeconomic Resources: Tourism and Recreation – Environmental Consequences

No effects on tourism and recreational use are anticipated as a result of the proposed project. Project activities would include ongoing stewardship and monitoring, which would occur from January 2020 through December 2024. No operation and maintenance activities would be associated with the project. Data are currently being collected as part of the Alabama Coastal Bird Stewardship Program Phase I project, which is currently underway. Continued activities would not change tourism and recreational opportunities in the project area. Overall, the project would result in direct and indirect, long-term, beneficial impacts on tourism and recreation by reducing human disturbances, potentially leading to enhanced nesting success, and increased passive recreation such as bird watching. Furthermore, the collection of nesting data would inform future conservation efforts.

4.4.2 Stewardship of Coastal Alabama Beach Nesting Bird Habitat—Stewardship and Monitoring Only

The affected environment for the Stewardship of Coastal Alabama Beach Nesting Bird Habitat – Stewardship and Monitoring Only project is the same as described in Section 4.4.1, Stewardship of Coastal Alabama Beach Nesting Bird Habitat. The section below therefore addresses just the environmental consequences for this project.

4.4.2.1 Biological Resources: Birds – Environmental Consequences

Impacts on birds would be similar to those described for the Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative, except direct and indirect, beneficial impacts associated with predator management activities, deployment of decoys, and habitat enhancement would not occur. Overall, the

project would result in long-term, beneficial impacts on birds by reducing human disturbances, which could enhance nesting success. Monitoring would inform future conservation efforts.

4.4.2.2 Biological Resources: Rare and Protected Species – Environmental Consequences

Impacts on rare and protected species would be similar those described for the Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative, except direct and indirect, beneficial impacts associated with predator management, decoy deployment, and habitat enhancement activities would not occur. Overall, the project would result in long-term, beneficial impacts on rare and protected birds by reducing human disturbances, which could enhance nesting success. Monitoring would inform future conservation efforts. The AL TIG made a preliminary determination that the project *may affect, but would not be likely to adversely affect,* piping plover; red knot; and Green, Kemp's ridley, and loggerhead sea turtles, and would result in *no damage or adverse modification* to piping plover or loggerhead sea turtle critical habitat. If this project were to become a preferred alternative and be selected for implementation, the AL TIG would share resource information for these protected resources with USFWS and NMFS and request technical assistance with impact determinations. Once the technical assistance were complete, any necessary consultations would be initiated and completed prior to completion and approval of the Final RP III/EA.

4.4.2.3 Socioeconomic Resources: Cultural Resources – Environmental Consequences

This project would involve monitoring, outreach, and education activities with the public regarding the vulnerable beach nesting birds. This work would ultimately lead to increased nest success lands in the project area. This project's actions would be both non-invasive and very minimally invasive due to the installation of symbolic (temporary post and rope) and/or exclusionary fencing around nesting areas prior to the start of the nesting season to reduce human ingress and disturbance. There would be no infrastructure or construction associated with the project beyond the temporary fencing/barriers described herein. As such there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP).

4.4.2.4 Socioeconomic Resources: Tourism and Recreation – Environmental Consequences

Impacts on tourism and recreation in the project area would be similar to those described above for the Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative, except direct and indirect, beneficial impacts associated with predator management activities, decoy deployment, and habitat enhancement would not occur. Overall, the project would result in long-term, beneficial impacts on tourism and recreation by reducing human disturbances, potentially leading to enhanced nesting success, and increased passive recreation such as bird watching. Furthermore, the collection of nesting data would inform future conservation efforts.

4.4.3 Dauphin Island West End Acquisition

4.4.3.1 Biological Resources: Birds – Affected Environment

The west end of Dauphin Island encompasses a diversity of coastal habitats that provide important nesting, foraging, and loafing habitats for resident and migratory birds, in addition to other coastal wildlife species. Habitats in the project area include sweeping dunes, salt marsh, coastal scrub, and beach flats. Over the course of a year, 200 or more species of birds may occur at the west end of Dauphin Island, including wading birds, shorebirds, waterfowl, and passerines (National Audubon Society, 2019). Dauphin Island provides important stopover habitat for birds crossing the Gulf of Mexico during seasonal migrations. When migrating north, the coastal habitats of Dauphin Island provide birds with the first potential foraging habitat after crossing the Gulf of Mexico. When returning south, these

habitats provide birds with one last foraging opportunity before crossing open water (Rosenberg et al., 2016). The entire project area is considered to be an Audubon Society Important Bird Area (National Audubon Society, 2019).

4.4.3.2 Biological Resources: Birds – Environmental Consequences

The acquisition and management of the west end of Dauphin Island would protect and manage 838 acres of nesting, foraging, and loafing habitat for resident and migratory birds (National Audubon Society, 2019), resulting in direct and indirect, long-term, beneficial impacts. The acquisition would ensure that these important habitats would remain available to birds and would not be subject to future development. Similarly, the acquisition of the west end of Dauphin Island would have indirect, long-term, beneficial impacts on other (non-avian) wildlife species because the 838 acres of coastal barrier island habitat would be protected. Public ownership of the west end of the island would also allow for optimal bird stewardship and habitat management, which would be guided by a bird conservation and management plan that would be developed by Mobile County and the Town of Dauphin Island in consultation with ADCNR and other entities. The plan would include a prioritized list of site-specific management actions and potential restoration projects designed to increase nesting bird populations and/or improve habitat quality and availability. Restoration activities could include active stewardship and education in conjunction with symbolic or exclusionary fencing, predator control and management, decoy deployment, and habitat and nesting enhancement activities, as described in the Trustees' Strategic Framework for Bird Restoration Activities (DWH Trustees, 2017). Implementation of the bird conservation and management plan would have long-term, beneficial impacts on birds.

4.4.3.3 Biological Resources: Rare and Protected Species – Affected Environment

ESA-listed species that are known to occur or may occur in the project area:

- **Piping plover:** known to occur seasonally in the project area
- **Red knot:** known to occur on sand flats in coastal Alabama and likely to be seasonally present in the project area
- **Green sea turtle:** present in Alabama coastal waters and occasionally nests on Alabama beaches (late May–October) (STB, 2019)
- **Hawksbill sea turtle:** known to occur seasonally in Alabama coastal waters and could be present in the project area on occasion
- **Kemp's ridley sea turtle:** present in Alabama coastal waters and occasionally nests on Alabama beaches, including Dauphin Island (late May–October) (STB, 2019)
- **Leatherback sea turtle:** known to occur seasonally in Alabama coastal waters and could be present in the project area on occasion
- **Loggerhead sea turtle:** present in Alabama coastal waters and frequently nests on Alabama beaches, including Dauphin Island (late May–October) (STB, 2019)
- **West Indian manatee:** present in all Alabama coastal waters and likely to be present in the project area
- **Gulf sturgeon:** known to occur in Mississippi Sound and likely to be present near the project area

The west end of Dauphin Island contains designated critical habitat for piping plover. The surrounding waters in Mississippi Sound are designated critical habitat for gulf sturgeon. Dolphins are common in Alabama coastal waters and are likely to be frequently present near the project area. Other state-

protected and rare species that could occur in the project area include but are not limited to Mississippi diamondback terrapin, American oystercatcher, snowy plover, Wilson's plover, and reddish egret.

4.4.3.4 Biological Resources: Rare and Protected Species – Environmental Consequences

The acquisition and management of the west end of Dauphin Island would protect and manage 838 acres of pristine coastal habitat, resulting in long-term, beneficial impacts for many rare and protected species. The acquisition would ensure that these important habitats would be protected in perpetuity and would not be subject to potential future development. ESA-listed species that would benefit from the project include piping plover, red knot, green sea turtle, Kemp's ridley sea turtle, and loggerhead sea turtle. Therefore, the AL TIG made a preliminary determination that the project *may affect, but would not be likely to adversely affect,* these species. Piping plover critical habitat would receive additional protection by ensuring that future development would not occur. Therefore, the AL TIG determined that the project would result in *no damage or adverse modification* to piping plover critical habitat. The project would have no effect on hawksbill sea turtle, leatherback sea turtle, West Indian manatee, and gulf sturgeon because the acquisition would be limited to terrestrial habitats, and no in-water activities would occur. Therefore the AL TIG determined that there would be in *no damage or adverse modification* to gulf sturgeon critical habitat. The AL TIG has shared resource information for these protected resources with USFWS and NMFS and has requested technical assistance with impact determinations. Once the technical assistance is complete, any necessary consultations will be initiated and completed prior to completion and approval of the Final RP III/EA.

Other state-protected and rare species that would benefit from habitat protection and management provided by the project include Mississippi diamondback terrapin, American oystercatcher, snowy plover, Wilson's plover, and reddish egret. Overall, the project would result in long-term, beneficial impacts on rare and protected species.

4.4.3.5 Socioeconomic Resources: Cultural Resources – Affected Environment

The Alabama Gulf Coast is one of the most historically significant regions of the South. It was popular with prehistoric Native Americans for fishing and food gathering long before the first European explorers arrived on the coast (Cox, 2012). Coordination with the AHC regarding the extent and nature of cultural resources at all of the locations under consideration in this Draft RP III/EA is ongoing. This information is not available at this time but will be included in the Final RP III/EA.

4.4.3.6 Socioeconomic Resources: Cultural Resources – Environmental Consequences

If cultural, historic, and/or archeological resources were discovered during any project activities, all restoration activities would cease and ADCNR and AHC would be immediately notified. No additional restoration activities would take place until cleared by ADCNR and AHC. The project's proposed actions would be non-invasive. As such there would be no involvement with historic properties or other cultural resources such as archeological sites and historic landscapes as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP).

4.4.3.7 Socioeconomic Resources: Tourism and Recreation – Affected Environment

The undeveloped 9-mile stretch of land that comprises the west end of Dauphin Island is private property. Currently, even though it is a private site, it informally provides opportunities for beach access, fishing, and boating. Parking is available near the proposed project site at the West End Public Beach access point. The western reaches of the property are only accessible by foot or boat.

4.4.3.8 Socioeconomic Resources: Tourism and Recreation – Environmental Consequences

The proposed acquisition of the west end property for use as a designated habitat area would result in maintenance of the property as natural habitat. Although visitors would still be able to access the site, bird management on the west end of the property may require closures for species protection, which would be a partial and temporary loss of an undeveloped public tourism and recreational amenity. Some users could choose to pursue activities in other available local or regional areas. Consequently, long-term, minor, adverse impacts on tourism and recreation would occur if the visitor experience were modified.

4.4.4 No Action Alternative – Birds

4.4.4.1 Biological Resources: Birds – Environmental Consequences

Under the no action alternative, projects with the goal of restoring coastal Alabama bird populations and habitats would not occur. The Alabama Coastal Bird Stewardship Program would expire when funding runs out, and acquisition of the west end of Dauphin Island would not occur. If the west end of Dauphin Island remained in its current condition, there would be no resulting beneficial impact on birds or their habitat. If the west end were developed for other uses, impacts on resident and migratory birds would likely be long term, moderate to major, and adverse impacts as a result of habitat loss.

4.4.4.2 Biological Resources: Rare and Protected Species – Environmental Consequences

Under the no action alternative, projects with the goal of restoring coastal Alabama bird populations and habitats would not occur. Benefits to rare and protected species associated with these projects would not occur. The Alabama Coastal Bird Stewardship Program would expire when funding runs out, and the acquisition of the west end of Dauphin Island would not occur. If the west end of Dauphin Island remained in its current condition, there would be no resulting beneficial impact on rare and protected species and habitats. If the west end were developed for other uses, impacts on rare and protected species would likely be long term, moderate to major, and adverse as a result of habitat loss.

4.4.4.3 Socioeconomic Resources: Cultural Resources – Environmental Consequences

Under the no action alternative, projects related to the goal of enhanced bird stewardship would not occur; funding for ongoing data collection of coastal bird populations would not be granted. Property containing vitally important beach/dune habitat being considered for acquisition would remain in its current undeveloped condition but could be purchased for future development. If the property were purchased for future development, previously undiscovered resources could be discovered, and the impacts would be adverse. Without continued funding for the ongoing monitoring of coastal bird populations, cultural resources would not be affected over the long term. Prehistoric or historic districts, sites, buildings, structures, or objects included in, or eligible for inclusion in, the NRHP would not be affected and would continue to be managed without change.

4.4.4.4 Socioeconomic Resources: Tourism and Recreation – Environmental Consequences

Under the no action alternative, projects related to the goal of enhanced bird stewardship would not occur; funding for ongoing data collection of coastal bird populations would not be granted; and property containing vitally important beach/dune habitat being considered for acquisition would remain in private ownership with the potential to be developed in the future. Public access to the property may not be maintained if the property were purchased for private development. Without continued funding for the ongoing data collection on coastal bird populations, tourism and recreational opportunities could be adversely affected over the long term. This would occur in cases where research was not available to ascertain proper methods for species enhancement, resulting in a possible long-term decline in viability

of coastal bird populations. If property containing vitally important beach/dune habitat were developed, there would likely be minor to moderate impacts on tourism and recreational resources because further development on the properties would reduce the opportunities for passive recreation, with the level of impact related to the type and intensity of development.

4.5 COMPARISON OF ALTERNATIVES

A summary of environmental consequences of the evaluated alternatives is provided below in Tables 4-3 and 4-3.

Table 4-3: Summary of Environmental Consequences for Provide and Enhance Recreational Opportunities Projects

Project	Hydrology and Water Quality	Habitats	Wildlife	Marine and Estuarine Resources	Rare and Protected Species	Federally Managed Fisheries	Cultural Resources	Tourism and Recreation	Aesthetics and Visual Resources
Perdido River Land Acquisition (Molpus Tract)	Short-term, minor, adverse impacts are expected during the installation of the canoe/kayak launch and parking improvements. Impacts include increased turbidity and sedimentation. Placing this land in conservation would have long-term, beneficial impacts on hydrology, water quality, floodplains, and wetlands. Any net increase in impervious surfaces would have a permanent, minor increase in polluted stormwater runoff that could be mitigated by low-impact development.	Conservation and restoration would increase the amount of longleaf pine in the area, resulting in long-term, beneficial impacts. Conservation of the tract would also eliminate future timber harvests and allow the existing managed pine plantations to return to natural ecological conditions. Therefore, the project would have long-term, beneficial impacts on local habitats.	Construction of amenities would result in short-term, minor, adverse impacts on wildlife from potential disturbances associated with noise and human presence. These adverse impacts would be outweighed by long-term, beneficial impacts resulting from conservation of the tract.	The project would have no short- or long-term impacts on marine or estuarine fauna because the project area is located along the Perdido River, approximately 15 miles upstream of Perdido Bay. It does not contain marine or estuarine habitats or fauna.	Construction of amenities could result in short-term, minor, adverse impacts on rare and protected species from potential disturbances associated with noise and human presence. However, any potential adverse impacts would be outweighed by long-term, beneficial impacts that result from conservation of the tract.	There are no federally managed species or EFH in the project area. Therefore, the project would have no short- or long-term impacts on these resources.	The project's proposed actions would be non-invasive and minimally invasive and would not negatively affect cultural resources. As such there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP).	No short-term impacts are expected. Placing this land in conservation would have long-term, beneficial impacts on tourism and recreational use as the result of greater opportunities for passive recreation.	No adverse impacts on aesthetics or visual character would occur. Long-term, beneficial effects are expected as the result of preserving the undeveloped character of the landscape.
Bayfront Park Restoration and Improvement Phase IIa and IIb	Construction of a sand pocket beach would have permanent, minor, adverse impacts on wetlands. Short-term, adverse impacts are expected during construction and stabilization of the beach, including increased siltation and turbidity. Over the long term, sand nourishment and native plantings would have beneficial impacts on hydrology, water quality, floodplains, and wetlands by improving storm resiliency, and providing habitat for filter feeders that improve water quality. Any net increase in impervious surfaces would have a permanent, minor increase in polluted stormwater runoff that could be mitigated by low-impact development.	Improvements to the park entrance, access road, and parking areas would increase disturbance to the pine flatwoods habitat. The construction of a 10-acre sand pocket beach would also disturb the brackish tidal marsh and savanna wet prairie habitats along Mobile Bay. Therefore, the project would have moderate long-term adverse impacts on local habitats.	Construction of the proposed amenities would result in short- and long-term, minor adverse impacts on wildlife from potential disturbances associated with noise and human presence and mortality of some intertidal species that may be buried during construction of the sand beach.	Construction of the proposed amenities would result in short- and long-term, minor adverse impacts on marine and estuarine resources from the mortality of some intertidal species associated with construction of the sand beach and increased noise during the construction period.	Construction of the proposed amenities would result in short- and long-term, minor, adverse impacts on rare and protected species from increased turbidity and temporary disturbances associated with noise and human presence during the construction period.	Construction of the sand beach would result in short-term, minor, adverse impacts on federally managed fisheries and EFH from increased turbidity during the construction period.	To ensure there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP), ADCNR would initiate an archaeological records review and consultation with AHC once preliminary design and construction plans are available. Appropriate actions would be undertaken as required as a result of this records review and consultation.	Temporary, minor impacts on tourism and recreation would occur during the construction period, when public access to park amenities would be restricted. Overall, the project would have long-term benefits on tourism and recreation at Bayfront Park by providing improved access to the natural resources in south Mobile County.	Short-term, moderate impacts on aesthetics and visual resources would occur during the construction period. Overall, long-term benefits on aesthetics and visual resources would occur from the proposed improvements.

Project	Hydrology and Water Quality	Habitats	Wildlife	Marine and Estuarine Resources	Rare and Protected Species	Federally Managed Fisheries	Cultural Resources	Tourism and Recreation	Aesthetics and Visual Resources
Bayfront Park Restoration and Improvement Phase IIa	Impacts related to hydrology, water quality, floodplains and wetlands would be the same as those described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative.	Impacts on habitats would be the same as those described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative, except there would be no impacts associated with replacing and expanding existing boardwalks and overlooks or adding additional walkways and ADA parking because these improvements would not be constructed. Overall, the project is expected to have moderate, long-term, adverse impacts on local habitats.	Impacts on wildlife would be the same as those described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative except there would be no impacts associated with replacing and expanding existing boardwalks and overlooks or adding additional walkways and ADA parking because these improvements would not be constructed. Overall, the project would result in short- and long-term, minor, adverse impacts on wildlife.	Impacts on marine and estuarine resources would be the same as those described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative except there would be no impacts associated with replacing and expanding existing boardwalks and overlooks or adding additional walkways and ADA parking because these improvements would not be constructed. Overall, the project would result in short- and long-term, minor, adverse impacts on marine and estuarine resources.	Impacts on rare and protected species would be the same as those described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative, except no impacts would be associated with replacing and expanding existing boardwalks and overlooks or adding additional walkways and ADA parking because these improvements would not be constructed. Overall, the project is expected to have short- and long-term, minor, adverse impacts on rare and protected species.	Impacts on federally managed fisheries would be the same as those described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative.	Information regarding cultural resources would be the same as described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative.	Impacts on tourism and recreation would be the same as those described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative, except replacing and expanding existing boardwalks and overlooks or adding additional walkways and ADA parking would not occur. Overall, impacts on tourism and recreation would be beneficial over the long term.	Impacts on aesthetics and visual resources would be the same as described for the Bayfront Park Restoration and Improvement Phase IIa and IIb alternative, except replacing and expanding existing boardwalks and overlooks, or adding additional walkways and ADA parking, would not occur. Overall, impacts on aesthetics and visual resources would be beneficial over the long term.
Gulf State Park Pier Renovation	There would be no short-term impacts on water quality from the implementation of this project. The pier upgrades would occur using small equipment and manual labor. The installation of a new fish cleaning station would have long-term, beneficial impacts on water quality surrounding the pier because more fish carcasses would be disposed of properly, which would limit the amount of fish scraps that would be thrown in the water. Any incorporation of low-impact development could decrease long-term, minor polluted stormwater runoff and therefore be a net water quality benefit.	No impacts on beach vegetation or unconsolidated shore are anticipated because these habitats would not be modified. Replacing the fish cleaning station would improve water conditions in the project area because fish carcasses would not be thrown into open water by anglers. The new wildlife-friendly lights would also improve habitat conditions for sea turtles. Therefore, the project is anticipated to have minor, long-term, beneficial impacts on local habitats.	The proposed improvements would result in short-term, minor, adverse impacts on wildlife from potential disturbances associated with noise and human presence during construction. Replacing the fish cleaning station would have long-term, beneficial impacts on wildlife because anglers would not throw fish carcasses into open water, thereby reducing potential for interactions with birds, sharks, and other non-target wildlife species. Wildlife-friendly lighting would decrease light pollution and its long-term impacts.	The project would have no adverse impacts on marine and estuarine resources because no in-water work would occur. Replacing the fish cleaning station would improve water conditions in the project area because anglers would not throw fish carcasses into open water. Therefore, the project is expected to have direct, long-term, beneficial impacts on marine and estuarine resources.	The proposed improvements would result in short-term, minor, adverse impacts on rare and protected species from potential disturbances associated with noise and human presence during construction. Replacing the current parking lot lighting with wildlife-friendly lights would have long-term, beneficial impacts on nesting sea turtles. Wildlife-friendly lighting would decrease light pollution and its long-term impacts.	The project would not have adverse impacts on federally managed fisheries because there would be no in-water work. Replacing the fish cleaning station would improve water conditions in the project area because anglers would not throw fish carcasses into open water. Therefore, the project is expected to have direct, long-term, beneficial impacts on federally managed fisheries and EFH.	The project's proposed actions would be non-invasive. As such there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP).	Short-term, minor impacts on tourism and recreation would occur during the construction period. Overall, once the improvements were complete, the project would have long-term benefits on tourism and recreation at Gulf State Park by providing improved access to fishing and sightseeing opportunities.	Short-term, minor impacts on aesthetics and visual resources would occur during the construction period. Overall, long-term benefits on aesthetics and visual resources would occur from the proposed improvements.
Perdido Beach Public Access Coastal Protection	Short-term impacts to water quality could occur during project construction and	Use of construction equipment would result in minor, short-term adverse	Placement of breakwaters and beach nourishment would	Placement of breakwaters and beach nourishment would	Placement of breakwaters and beach nourishment would	Placement of breakwaters and beach nourishment	The project's proposed actions are minimally invasive in locales that have largely been previously	Short-term, minor impacts on tourism and recreation would occur during the	Short-term, moderate impacts on aesthetics and visual resources

Project	Hydrology and Water Quality	Habitats	Wildlife	Marine and Estuarine Resources	Rare and Protected Species	Federally Managed Fisheries	Cultural Resources	Tourism and Recreation	Aesthetics and Visual Resources
	implementation. All work would be completed by water access except for the plantings and sand nourishment, which would be delivered by truck. This could cause an increase in turbidity and water pollution in the short term. Native plantings and breakwaters would provide long-term, beneficial impacts on the water quality in Perdido Bay by improving shoreline resiliency and reducing erosion.	impacts habitat through compaction of on-site soils, increased turbidity, increased sedimentation, vegetative damage or disturbance, and the potential for chemical run-off from construction equipment. However, the installation of native wetland and upland vegetation in the project area would stabilize soils, resulting in long-term, beneficial impacts to local habitats. Placement of breakwaters would permanently convert soft bottom benthic habitat to hard bottom habitat within the footprint of the breakwater resulting in long-term, minor, adverse and beneficial impacts.	result in short-term, minor adverse impacts on wildlife from potential disturbances associated with noise and increased turbidity during construction. Restoration of coastal habitat would result in long-term, beneficial impacts on terrestrial species.	result in short-term, minor, adverse impacts on marine and estuarine resources from increased turbidity during construction and mortality of some benthic species. Conversion of soft bottom habitat to hard structure would have long-term, minor, adverse impacts for some species, and beneficial impacts for others.	result in short-term, minor, adverse impacts on rare and protected species from potential disturbances associated with noise and increased turbidity during construction. Restoration of coastal habitat would result in long-term, beneficial impacts on rare and protected species.	would result in short-term, minor, adverse impacts on federally managed fisheries and EFH from increased turbidity during construction. The breakwater structures may provide habitat for some federally managed fish, resulting in long-term, beneficial impacts.	disturbed, and are also non-invasive in nature. There would be no additional infrastructure or building construction associated with the project beyond that which is described herein. Based on these project activities, here would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP).	construction period when public access to the beach would be restricted. There would be long-term, beneficial impacts on tourism and recreation from enhancements to the beach.	would occur during the construction period. Overall, long-term benefits on aesthetics and visual resources would accrue from the project.
BSNWR Recreation Enhancement – Mobile Street Boardwalk	Short-term, adverse impacts are expected during the leveling and paving of a permeable parking lot. Long-term, beneficial impacts on wetlands and water quality are expected from the reduction in erosion and sedimentation.	The project would occur in previously disturbed or developed areas. However, adjacent habitats could be adversely affected during construction. Once construction is complete, these habitats would stabilize, resulting in minor, short-term, adverse impacts on local habitats.	The proposed improvements would result in short-term, minor, adverse impacts on birds and other wildlife from potential disturbances associated with noise and human presence during construction.	The project would have no adverse impacts on marine and estuarine resources because no in-water work would occur.	The proposed improvements would result in short-term, minor to moderate, adverse impacts on rare and protected species and critical habitat from potential disturbances associated with noise and human presence during construction.	The project would have no adverse impacts on federally managed fisheries or EFH because no in-water work would occur.	To ensure there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP), ADCNR would initiate an archaeological records review and consultation with AHC once preliminary design and construction plans are available. Due to the historically sensitive nature of the area, and in consultation with the AHC, an archaeological survey would need to be completed before any construction activities are undertaken.	Short-term, minor adverse impacts on tourism and recreation would occur during the construction period. Overall, once the improvements were complete, the project would have long-term benefits on tourism and recreation at BSNWR.	Short-term, minor adverse impacts on aesthetics and visual resources would occur during the construction period. Overall, long-term benefits to aesthetics and visual resources would occur from the proposed improvements, which would promote enhanced access to scenic resources at BSNWR.

Project	Hydrology and Water Quality	Habitats	Wildlife	Marine and Estuarine Resources	Rare and Protected Species	Federally Managed Fisheries	Cultural Resources	Tourism and Recreation	Aesthetics and Visual Resources
BSNWR Recreation Enhancement – Centennial Trail Boardwalk	Short-term, adverse impacts are expected during the leveling and paving of a permeable parking lot. Long-term, beneficial impacts on wetlands and water quality are expected from the reduction in erosion and sedimentation.	The project would occur in previously disturbed or developed areas. However, adjacent habitats could be adversely affected during construction. Once construction is complete, these habitats would stabilize, resulting in minor, short-term, adverse impacts on local habitats.	The proposed improvements would result in short-term, minor, adverse impacts on birds and other wildlife from potential disturbances associated with noise and human presence during construction.	The project would have no adverse impacts on marine and estuarine resources because no in-water work would occur.	The proposed improvements would result in short-term, minor, adverse impacts on rare and protected species from potential disturbances associated with noise and human presence during construction.	The project would have no adverse impacts on federally managed fisheries or EFH because no in-water work would occur.	To ensure there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP), ADCNR would initiate an archaeological records review and consultation with AHC once preliminary design and construction plans are available. Due to the historically sensitive nature of the area, and in consultation with the AHC, an archaeological survey would need to be completed before any construction activities are undertaken.	Short-term, minor adverse impacts on tourism and recreation would occur during the construction period. Overall, once the improvements were complete, the project would have long-term benefits on tourism and recreation at BSNWR.	Short-term, minor adverse impacts on aesthetics and visual resources would occur during the construction period. Overall, long-term benefits to aesthetics and visual resources would occur from the proposed improvements, which would promote enhanced access to scenic resources at BSNWR.

Table 4-4: Summary of Environmental Consequences for Bird Projects

Project	Wildlife (Birds)	Rare and Protected Species	Cultural Resources	Tourism and Recreation
Stewardship of Coastal Alabama Beach Nesting Bird Habitat	Stewardship activities, including installing symbolic (temporary post and rope) and/or exclusionary fencing around nesting areas, predator management, deploying decoys, nest monitoring, and habitat enhancements (including removing vegetation and installing/distributing shell hash) under the project would have short- and long-term, beneficial impacts on birds by reducing human disturbances and predation, which could enhance nesting success. Monitoring would inform future conservation efforts.	Stewardship activities, including installing symbolic (temporary post and rope) and/or exclusionary fencing around nesting areas, predator management, deploying decoys, nest monitoring, and habitat enhancements (including removing vegetation and installing/distributing shell hash) under the project would result in short- and long-term, beneficial impacts on rare and protected species by reducing human disturbances and predation, which could enhance nesting success. Monitoring would inform future conservation efforts.	This project's actions would be both non-invasive and minimally invasive from the installation of symbolic (temporary post and rope) and/or exclusionary fencing around nesting areas prior to the start of the nesting season to reduce human ingress and disturbance. No infrastructure or construction would be associated with the project beyond the temporary fencing/barriers described herein. As such there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP).	No effects on tourism and recreational use are anticipated as a result of the proposed project because no operation and maintenance activities would be associated with the project. Overall, the project would result in direct and indirect, long-term, beneficial impacts on tourism and recreation by reducing human disturbances, potentially leading to enhanced nesting success, and increased passive recreation such as bird watching.
Stewardship of Coastal Alabama Beach Nesting Bird Habitat—Stewardship and Monitoring Activities	Impacts on birds would be similar to those described for the Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative, except beneficial impacts associated with predator management activities, deploying decoys, and habitat enhancements would not occur. Overall, the project would result in direct and indirect, long-term, beneficial impacts on birds by reducing human disturbances, which could enhance nesting success. Monitoring would inform future conservation efforts.	Impacts on rare and protected species would be similar to those described for the Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative, except beneficial impacts associated with predator management activities, deploying decoys, and habitat enhancements would not occur. Overall, the project would result in direct and indirect, long-term, beneficial impacts on rare and protected species by reducing human disturbances, which could enhance nesting success. Monitoring would inform future conservation efforts.	This project's actions would be both non-invasive and minimally invasive from the installation of symbolic (temporary post and rope) and/or exclusionary fencing around nesting areas prior to the start of the nesting season to reduce human ingress and disturbance. There would be no infrastructure or construction associated with the project beyond the temporary fencing/barriers described herein. As such there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP).	Impacts on tourism and recreation in the project area would be similar to those described above for the Stewardship of Coastal Alabama Beach Nesting Bird Habitat alternative, except direct and indirect, beneficial impacts associated with predator management activities, deploying decoys, and habitat enhancements would not occur. Overall, the project would result in direct and indirect, long-term, beneficial impacts on tourism and recreation by reducing human disturbances, potentially leading to enhanced nesting success, and increased passive recreation such as bird watching.
Dauphin Island West End Acquisition	The project would protect 838 acres of nesting, foraging, and loafing habitat for hundreds of resident and migratory birds, resulting in long-term, beneficial impacts on birds.	The project would protect 838 acres of nesting, foraging, and loafing habitat for hundreds of resident and migratory birds, resulting in long-term, beneficial impacts on rare and protected species.	The project's proposed actions would be non-invasive. As such there would be no involvement with historic properties as defined in 36 CFR 800.16 (specifically, any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP).	Although visitors would still be able to access the public beach area, bird management on the west end property may require closures for species protection, which would be a partial and temporary loss in public tourism and recreational amenity on undeveloped lands. Some users could choose to pursue activities in other available local or regional areas. Overall, long-term, minor, partial and temporary, adverse impacts on tourism and recreation would occur.

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4.6 POTENTIAL CUMULATIVE IMPACTS

Section 6.6 and Appendix 6B of the Final PDARP/PEIS are incorporated by reference into the following cumulative impacts analysis, including the methodologies for assessing cumulative impacts, identification of affected resources, and the cumulative impacts scenario. To effectively consider the potential cumulative impacts, the AL TIG identified past, present, and reasonably foreseeable future actions along the Alabama coast near the proposed project areas. Table 4-5 identifies the cumulative action scenario for this Draft RP III/EA. Many of the resources analyzed would only have negligible to minor, adverse and/or beneficial effects. Resources with negligible to minor effects will not be included in the cumulative impacts analysis to appropriately narrow the scope of the environmental analysis to the issues that would have an influence on the decision-making process or deserve attention from an environmental perspective (Council on Environmental Quality, 1997). The resources excluded from this cumulative impacts analysis because they were not carried forward for analysis or based on their beneficial or negligible to minor, adverse effects are listed below:

- Physical Environment: geology and substrates, hydrology and water quality, air quality and greenhouse gas emissions, and noise
- Biological Environment: protected species and living coastal and marine resources
- Human Uses and Socioeconomics: socioeconomics and environmental justice, cultural resources, infrastructure, land and marine management, fisheries and aquaculture, land and marine transportation, and public health and safety

The following resources were analyzed in detail for environmental consequences that could result from implementation of the proposed alternatives/projects:

- Physical Environment: habitats (moderate impacts are expected only under the Bayfront Park Restoration and Improvement Phase IIa and IIb and Perdido Beach Public Access Coastal Protection projects)
- Human Uses and Socioeconomics: aesthetics (moderate impacts are expected under the Gulf State Park Pier, Perdido Beach Public Access Coastal Protection, and BSNWR Recreation Enhancements – Mobile Trail and BSNWR Recreation Enhancements – Centennial Trail Boardwalk) and tourism and recreation (moderate impacts are expected only under the Dauphin Island West End Acquisition project)

4.7 CUMULATIVE IMPACT ANALYSIS

The following section describes the cumulative impacts of the alternatives being considered when combined with other past, present, and reasonably foreseeable future actions. The analysis below considers the impacts of the cumulative actions identified in Table 4-5. The analysis recognizes that in most cases, the contribution to the cumulative impacts for a given resource from implementing the alternatives would be difficult to discern. In many situations, implementing one of the alternatives would likely help reduce overall long-term, adverse impacts by providing a certain level of offsetting benefits, especially when considered in concert with other actions of similar nature (e.g., stewardship programs or non-NRDA restoration). The cumulative impact analysis is evaluated by affected resource. Effects may come together in several ways to result in cumulative effects. For purposes of the following analysis, cumulative effects have been identified and may fall under one or more of four categories:

Table 4-5: Cumulative Action Scenario

Category	Action Description	Key Resource Areas with Potential to Contribute to Cumulative Impacts
Restoration Related to the DWH oil spill (DWH Early Restoration, AL TIG RP I and II, RESTORE Act, GEBF, North American Wetlands Conservation Fund, National Academy of Sciences)	Non-NRDA projects will leverage other funding sources where available to achieve habitat restoration. These programs seek to restore habitat, water quality, and living coastal and marine resources throughout coastal Alabama and in the greater Gulf coast region. Projects currently funded through the multiple restoration programs would improve bird populations, oyster populations, sea turtle populations, dune habitat, marsh habitat, and coastal resiliency through shoreline protection, habitat protection, hydrologic restoration, and acquisition. Restoration projects that have occurred under NRDA to date are described in Appendix B.	Habitats Aesthetic and Visual Resources Tourism and Recreation
Resource Stewardship: Marsh and Shoreline Restoration	Outside the NRDA process, various marsh and shoreline restoration efforts include: ▪ Boggy Point Living Shoreline Project ▪ Coffee Island Living Shoreline Study ▪ The Nature Conservancy Swift Tract Living Shoreline ▪ Helen Wood Park Living Shoreline ▪ Marsh Restoration in Oyster Bay	Habitats Aesthetic and Visual Resources Tourism and Recreation
Resource Stewardship: Land Acquisition	Land acquisition is currently occurring outside DWH restoration efforts, including the ADCNR-managed Forever Wild program that purchases land for conservation and recreational purposes. This program has secured more than 255,000 acres of land in Alabama for public use and created more than 220 miles of recreational trails in 22 new recreation areas and nature preserves, while providing additions to 10 state parks and 16 WMAs. Additionally, local land trusts such as Week's Bay Foundation, Pelican Point Conservancy, and Alabama Coastal Heritage Trust continue to purchase and manage properties throughout Mobile and Baldwin counties.	Habitats Aesthetic and Visual Resources Tourism and Recreation

Category	Action Description	Key Resource Areas with Potential to Contribute to Cumulative Impacts
Restoration Programs through Other State Agencies	Section 384 of the Energy Policy Act of 2005 (Public Law 109-58) establishes the Coastal Impact Assistance Program, which authorizes funds to be distributed to Outer Continental Shelf oil and gas producing states for the conservation, protection, and preservation of coastal areas, including wetlands. ADCNR was designated as the lead agency for development and implementation of the Coastal Impact Assistance Program. A list of completed and in progress Coastal Impact Assistance Program projects can be found here: http://www.outdooralabama.com/sites/default/files/images/file/Status%20of%20CIAP%20Grants%20rev4.pdf	Habitats Aesthetic and Visual Resources Tourism and Recreation
Coastal Development and Land Use	The Alabama coastal area is rapidly developing and will continue to be developed. Known projects include Amber Isle Development, Phoenix West II Condominium, and Gulf State Park Master Plan.	Habitats Aesthetic and Visual Resources Tourism and Recreation
Beach Nourishment	Alabama beach nourishment projects (Orange Beach, Gulf State Park, and Gulf Shores Beach) are a collaborative effort between ADCNR and local municipalities. These projects aim to restore beaches that have suffered a loss from storms and/or erosion to historical conditions by placing sand from offshore borrow sites via dredge and pipe.	Habitats Aesthetic and Visual Resources Tourism and Recreation

- **Additive adverse or beneficial effect—**Occurs when the adverse or beneficial impact on a resource adds to effects from other actions.
- **Synergistic (interactive) adverse effect—**Occurs when the net adverse impact on a resource is greater than the sum of the adverse impacts from individual actions (this could also result in a different type of impact than the impact from individual impacts; e.g., increased temperature discharges in water when added to increased nutrient loading can result in reduced dissolved oxygen).
- **Synergistic (interactive) beneficial effect—**Occurs when the net beneficial impact on a resource is greater than the sum of the benefits from individual actions (this could also result in a different type of impact than the impact of the individual impacts).
- **Countervailing effect—**Occurs when the overall net effect of two or more actions, when combined, is less than the sum of their individual effects.

In the following sections, the analysis is organized by resource and alternative. The methodology for determining cumulative impacts is described in the AL TIG RP II/EA (Chapter 14).

4.7.1 Habitats

The range of proposed alternatives in this Draft RP III/EA would have short-term, minor to moderate, adverse impacts on habitats in Baldwin and Mobile counties. Overall, the adverse impacts would be minor. Short-term impacts would result from projects with construction elements, such as the Bayfront Park Restoration and Improvement Phase II and Perdido Beach Public Access Coastal Protection projects, which would disturb habitats during construction and after the recreational improvements are complete. These projects would also result in long-term, beneficial impacts from the conservation of land that was previously subject to development (i.e., the Perdido River Land Acquisition [Molpus Tract]).

All of the actions identified in Table 4-5 have the potential to affect habitats. Short-term, adverse impacts from these actions would occur during construction. Implementation of other restoration projects, marsh and shoreline restoration, beach nourishment, and coastal development and land use impacts are expected to cause short-term habitat impacts from disturbance during construction. These impacts are expected to be short-term and minor, and in general, species would be able to use the sites for habitat soon after construction activities cease. Many of the actions in Table 4-5 would contribute beneficial impacts to habitats, including many of the restoration projects proposed under the AL TIG RP II, Early Restoration, NRDA, and other restoration projects occurring in the area with land acquisition projects providing long-term preservation of habitats. Some of the actions, such as coastal development, would likely result in permanent loss of habitat for area species, resulting in long-term, adverse impacts.

The intensity of both the beneficial and adverse, long-term impacts on habitats varies between the cumulative actions. Projects related to large-scale development (e.g., condominium development) have the potential to cause long-term or permanent, adverse impacts from habitat loss or degradation that are minor to major because of the habitat lost when housing and other development occurs. Restoration projects occurring in or near the water (DWH restoration projects, marsh restoration, and conservation through land acquisition) would have long-term benefits because the purpose of these projects is to restore and enhance these areas.

When the range of proposed alternatives in this Draft RP III/EA is analyzed in combination with other past, present, and reasonably foreseeable future actions, short- and long-term, adverse cumulative impacts on habitats would likely occur ranging from minor to moderate. However, the impact to habitats from the recreation and bird focused projects proposed in this plan would not contribute

substantially to adverse cumulative impacts because the moderate impacts would be related to large-scale development projects in the area. Overall, the projects proposed in this plan would have beneficial impacts from the preservation of habitat, either through land acquisition related to recreational use or preservation of bird habitat. The range of alternatives in this Draft RP III/EA, when carried out in conjunction with other environmental restoration efforts has the potential to result in long-term, moderate impacts on habitats, with the actions in this plan contributing a benefit to these adverse impacts through habitat preservation. While some adverse impacts from the actions proposed in this plan would occur from construction of new recreational amenities, disturbance would occur in already developed areas, such as Bayfront Park, or would be done to address erosion issues to existing habitat, such as is the case for the Perdido Beach Public Access Coastal Protection project. The Final PDARP/PEIS found that implementation of projects in the Restoration Types analyzed in this Draft RP III/EA is consistent with the goals of the selected alternative and is not expected to contribute substantially to short-term or long-term, adverse cumulative impacts on habitats when analyzed in combination with other past, present, and reasonably foreseeable future actions. This site-specific analysis for habitats is consistent with that finding.

4.7.2 Aesthetic and Visual Resources

Adverse impacts on aesthetic and visual resources would be minor overall because projects would modify existing recreational facilities or addressing conservation of bird habitat. For the Gulf State Park Pier Renovation, Perdido Beach Public Access Coastal Protection, and BSNWR Recreation Enhancements projects, impacts on aesthetics and visual resources would be short-term and moderate during construction because these areas are currently used for recreation and the presence of construction activities would affect users. However, after construction activities are complete, the addition of recreational amenities at these sites would be consistent with their current use as recreational areas and would result in a long-term benefit.

All of the actions identified in Table 4-5 could affect aesthetics and visual quality. For all projects, similar to the range of alternatives analyzed in this Draft RP III/EA, there would be short-term impacts for projects that include construction with impacts ranging from minor for projects with a construction period of a few months to a year (as is anticipated for marsh restoration and beach nourishment) to moderate for projects with a longer time frame (such as coastal development). Long-term impacts on aesthetic and visual resources would be mostly beneficial because restoration and land acquisition projects of various types would improve the visual qualities of areas. Projects that change the visual character of an area such as coastal development and dredging would have long-term, minor to moderate, adverse impacts.

When the range of proposed alternatives in this Draft RP III/EA is analyzed in combination with other past, present, and reasonably foreseeable future actions, cumulative impacts on aesthetics and visual resources would be short term, minor, and adverse because most of the projects involve a construction process that would change the visual character during construction, but would cease once construction is completed. However, the range of alternatives in this Draft RP III/EA would not contribute substantially to adverse cumulative impacts because many projects do not include a construction component or the construction is small in scale compared to other projects in the area. The range of alternatives in this Draft RP III/EA, when carried out in conjunction with other projects along the Alabama coast has the potential to result in long-term, beneficial cumulative impacts from enhancing the visual environment through land acquisition that preserves land, conservation, restoration, and enhancement of recreational amenities.

The Final PDARP/PEIS found that implementation of projects in the Restoration Types analyzed in this Draft RP III/EA is consistent with the goals of the selected alternative and is not expected to contribute substantially to short-term or long-term, adverse cumulative impacts on aesthetics and visual resources when analyzed in combination with other past, present, and reasonably foreseeable future actions. This site-specific analysis for aesthetics and visual resources is consistent with that finding.

4.7.3 Tourism and Recreation

Adverse impacts on tourism and recreation would be minor overall because projects would modify existing recreational facilities or address bird conservation. On the whole, the projects proposed in this Draft RP III/EA may have short-term, moderate impacts if an area is not accessible during construction, but would have long-term benefits once the recreational amenities are constructed and operational for the public. For projects under the Bird Restoration Type, the two projects related to the Stewardship of Coastal Alabama Beach Nesting Bird Habitat would involve data collection and research and would not affect tourism and recreation long-term directly but may provide long-term benefits by enhancing the environment. The Dauphin Island West End Acquisition alternative has the potential for temporary, adverse impacts on tourism and recreation, and conservation of the property for bird stewardship may require portions of the area to be closed to public use during bird management activities.

All of the actions identified in Table 4-5 could affect tourism and recreation. For all projects, similar to the range of alternatives analyzed in this Draft RP III/EA, there would be short-term impacts for projects that include construction with impacts ranging from minor for projects with a construction period of a few months to a year (as is anticipated for marsh restoration and beach nourishment) to moderate for projects with a longer time frame (such as coastal development) if recreational amenities are not available during construction. Long-term impacts on tourism and recreation would be mostly beneficial because restoration and land acquisition projects of various types would improve the natural environment, and where possible, provide additional recreational access through land acquisition and similar type projects. Projects that remove previously open areas from public access and recreational use such as the development of coastal land for residential use and dredging would have long-term, minor to moderate, adverse impacts.

When the range of proposed alternatives in this Draft RP III/EA is analyzed in combination with other past, present, and reasonably foreseeable future actions, cumulative impacts on tourism and recreation would be short term, minor, and adverse because most of the projects involve a construction process that would restrict use during construction, but would cease once construction is completed. the range of alternatives in this Draft RP III/EA would not contribute substantially to adverse cumulative impacts because many projects do not include a construction component or the construction is small in scale compared to other projects in the area. The range of alternatives in this Draft RP III/EA, when carried out in conjunction with other projects along the Alabama coast could have long-term, beneficial cumulative impacts on tourism and recreation through land acquisition, conservation, restoration, and enhancement of recreational amenities, all of which would provide areas for people to visit and recreate.

The Final PDARP/PEIS found that implementation of projects in the Restoration Types analyzed in this Draft RP III/EA is consistent with the goals of the selected alternative and is not expected to contribute substantially to short-term or long-term, adverse cumulative impacts on tourism and recreation when analyzed in combination with other past, present, and reasonably foreseeable future actions. This site-specific analysis for tourism and recreation is consistent with that finding.

5.0 COMPLIANCE WITH OTHER LAWS AND REGULATIONS

Chapters 3 and 4 of this document provide detailed information and OPA and NEPA analyses for each proposed restoration alternative, expected environmental consequences, and consistency with the Final PDARP/PEIS. In addition, coordination and reviews to ensure compliance with a variety of other legal authorities potentially applicable to the selected alternatives have begun. The AL TIG has shared Biological Evaluation forms for protected resources with USFWS and NMFS and has requested technical assistance with impact determinations. Once the technical assistance is complete, any necessary consultations will be initiated prior to approval of the Final RP III/EA.". Progress to date suggests that all the selected alternatives would meet permitting and other environmental compliance requirements and that all alternatives would be implemented in accordance with applicable laws and regulations. Compliances status will be presented in the Final RP III/EA. Federal environmental compliance responsibilities and procedures, which will follow the Trustee Council SOP, are presented in Section 9.4.6 of the SOP document. Following this SOP, the Implementing Trustees for each alternative will ensure that the status of environmental compliance (e.g., completed versus in progress) is tracked through the Restoration Portal. The Implementing Trustees will keep a record of compliance documents (e.g., ESA biological opinions, USACE permits) and ensure that they are submitted for inclusion in the Administrative Record.

5.1 ADDITIONAL FEDERAL LAWS

Additional federal laws may apply to the preferred alternatives considered in this Draft RP III/EA. Legal authorities applicable to restoration alternative development were fully described in the context of the DWH restoration planning in the Final PDARP/PEIS, Section 6.9, Compliance with Other Applicable Authorities, and Appendix 6.D, Other Laws and Executive Orders. That material is incorporated by reference here. Examples of applicable laws or executive orders include but are not necessarily limited to those listed below. Additional detail on each of these laws or executive orders can be found in Chapter 6 of the Final PDARP/PEIS.

- ESA (16 U.S.C. §§ 1531 et seq.)
- Magnuson-Stevens Act (16 U.S.C. §§ 1801 et seq.)
- Marine Mammal Protection Act (16 U.S.C. §§ 1361 et seq.)
- Coastal Zone Management Act (16 U.S.C. §§ 1451 et seq.)
- National Historic Preservation Act (16 U.S.C. §§470 et seq.)
- Coastal Barrier Resources Act (16 U.S.C. §§ 3501 et seq.)
- Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668 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.)
- Marine Protection, Research and Sanctuaries Act (16 U.S.C. §§ 1431 et seq. and 33 U.S.C. §§ 1401 et seq.)
- Estuary Protection Act (16 U.S.C. §§ 1221 et seq.)
- Archaeological Resource Protection Act (16 U.S.C. §§ 470aa–470mm)
- National Marine Sanctuaries Act (16 U.S.C. §§ 1431 et seq.)

- Farmland Protection Policy Act (7 U.S.C. §§ 4201–4209)
- Executive Order 11988, Floodplain Management (now as augmented by Executive Order 13690, January 30, 2015)
- Executive Order 11990, Protection of Wetlands
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Executive Order 12962, Recreational Fisheries
- Executive Order 13112, Safeguarding the Nation from the Impacts of Invasive Species
- Executive Order 13175, Consultation and Coordination with Indian Tribal Governments
- Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds
- Executive Order 13693, Planning for Federal Sustainability in the Next Decade

5.2 COMPLIANCE WITH STATE AND LOCAL LAWS AND OTHER FEDERAL REGULATIONS

Additional state laws may apply to the proposed preferred alternatives considered in this Draft RP III/EA. Potentially applicable state laws may include but may not be limited to:

- ADEM Division 8 Coastal Program Rules
- ADEM Division 6 Volume 1 Water Quality Program (National Pollutant Discharge Elimination System)

6.0 DRAFT MONITORING AND ADAPTIVE MANAGEMENT PLANS

MAM plan implementation was identified as one of the programmatic goals in the Final PDARP/PEIS. The DWH NRDA MAM Framework provides a flexible, science-based approach to effectively and efficiently implement restoration over several decades to provide long-term benefits for the resources and services injured by the DWH oil spill. The draft project MAM plans, included in Appendix E, identify the monitoring needed to evaluate progress toward meeting project objectives and to support adaptive management of the restoration project. The plans identify key sources of uncertainty, incorporate monitoring data needs and decision points that address these uncertainties, and establish a decision-making process for making adjustments, if needed. MAM plans are living documents and will be updated as needed to reflect changing conditions and/or new information. For example, a MAM plan may need to be revised if the project design changes, if initial data analysis indicates that the sampling design is inadequate, or if any uncertainties are resolved or new uncertainties are identified during project implementation and monitoring. Any significant future revisions to MAM plans will be made publicly available through the Restoration Portal.

MAM are major responsibilities for the AL TIG. As described in the Final PDARP/PEIS (Section 7.5.1), TIGs are responsible for both resource- and project-level MAM activities. The AL TIG has developed and will implement MAM plans for all restoration projects consistent with guidance provided by the Trustee Council. Data generated through monitoring will provide the basis for annual project reporting that keeps the public fully informed about project progress and for adaptive management and corrective action decisions. Monitoring data will also be applied to improve the likelihood of success and benefits of future projects. All of the projects in this Draft RP III/EA have an associated MAM plan, which is provided in Appendix E.

Many of the projects in this Draft RP III/EA would be implemented in partnership with entities that have deep expertise in their fields; this collaborative approach would leverage and expand existing efforts and increase confidence in outcomes and approaches for future restoration work. The content of each MAM plan depends on the type of project, the level of uncertainty, and the proposed activities.

The MAM plans have three primary purposes:

1. The first purpose is to identify how restoration managers will measure and track progress toward achieving restoration goals and objectives. This work is accomplished via monitoring specific parameters that, individually and collectively, help the AL TIG understand the extent to which a project is achieving its restoration objectives.
2. The second purpose is to increase the likelihood of successful implementation through identification, before a project begins, of potential corrective actions that could be undertaken if a project does not proceed as expected. This is accomplished by conceptually outlining the reasons why a project might fail to meet its objectives and responses the AL TIG could take to correct these problems. The focus is on restoration planning uncertainties for the project and how these uncertainties may be best addressed through project design and implementation decisions.
3. The third purpose is to capture, in a systematic way, lessons learned or new information acquired that can be incorporated into future project selection, design, and implementation. The evaluation section of each plan contains basic questions that the AL TIG will answer to help understand whether a project achieved its objectives, the unanticipated issues that were encountered during implementation, and how such issues were addressed. Such information will provide insights for future project development. This section will be updated with

additional information as monitoring methods are determined for each project. In the future, the AL TIG will work to identify ways to evaluate the overall success of the DWH restoration work by incorporating feedback from project-level evaluations into a larger resource-level framework to understand how projects could be expected to contribute collectively to restoration of injured resources and improved ecosystem conditions and functions along the Alabama coast.

The Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0 provides detailed information regarding the importance and use of adaptive management.

Appendix A
List of Preparers and Reviewers, Repositories, Literature Cited, and Acronyms

LIST OF PREPARERS AND REVIEWERS

Agency/Firm	Name	Position
Alabama Department of Conservation and Natural Resources	Amy Hunter	DWH Restoration Coordinator
Alabama Department of Conservation and Natural Resources	Carl Ferraro	Biologist
Alabama Department of Conservation and Natural Resources	Kelly Swindle	Coastal Restoration Specialist
State of Alabama/Rosen Harwood	Jane Calamusa	Attorney
State of Alabama/Rosen Harwood	Nicole Hampton	Attorney
State of Alabama/Louis Berger	Lori Fox	Senior Planner
State of Alabama/Louis Berger	Joe Dalrymple	Environmental Scientist
State of Alabama/Louis Berger	Kara Grosse	Environmental Scientist
State of Alabama/Louis Berger	Phillip Baigas	Wildlife Biologist
State of Alabama/Louis Berger	Spence Smith	Marine Biologist
State of Alabama/Louis Berger	Suni Shrestha	Senior Planner
State of Alabama/Louis Berger	Rebecca Reints	Planner
State of Alabama/Louis Berger	Derrick W. Rosenbach	Planner
State of Alabama/Louis Berger	Josh Schnabel	Planner
State of Alabama/Louis Berger	Tom Walker	Policy Analyst
State of Alabama/Louis Berger	Paul Graham	Senior Program Manager
State of Alabama/Volkert	Bethany Kraft	Senior Scientist
USDA	Ronald Howard	Program Specialist
USDA	Mark Defley	Biologist, Gulf Coast Ecosystem Restoration Team
USDA	Ben Battle	Gulf of Mexico Forest Restoration Program Manager
USEPA	Dan Holliman	Environmental Scientist
USEPA	Patrick Johnson	Attorney-Advisor

Agency/Firm	Name	Position
USEPA	Tim Landers	Environmental Protection Specialist
USEPA	Chris Parker	Life Scientist
NOAA	Dan VanNostrand	Marine Habitat Resource Specialist
NOAA/Earth Resources Technology, Inc	Stella Wilson	Marine Habitat Restoration Specialist
NOAA	Ramona Schreiber	Marine Habitat Resource Specialist
NOAA	Christy Fellas	Marine Habitat Resource Specialist
NOAA	Corinna McMackin	Attorney
NOAA	Jeff Shenot	Marine Habitat Resources Specialist
USDOI	John Rudolph	Attorney-Advisor
USDOI	Sarah Shattuck	Attorney-Advisor
USFWS	Dianne Ingram	Biologist
USFWS	Brian Spears	Biologist
USFWS	Robin Renn	USDOI DWH NEPA Coordinator

LIST OF REPOSITORIES

Library	Address	City	Zip
Dauphin Island Sea Lab, Admin Building	101 Bienville Boulevard	Dauphin Island	36528
Thomas B. Norton Public Library	221 West 19th Avenue	Gulf Shores	36542
Alabama Department of Conservation and Natural Resources, State Lands Division, Coastal Section Office	31115 Five Rivers Boulevard	Spanish Fort	36527
Weeks Bay National Estuarine Research Reserve	11300 US Highway 98	Fairhope	36532
Mobile Public Library, West Regional Library	5555 Grelot Road	Mobile	36609

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LIST OF ACRONYMS

ADA	Americans with Disability Act
ADCNR	Alabama Department of Conservation and Natural Resources
ADEM	Alabama Department of Environmental Management
AHC	Alabama Historical Commission
AL TIG	Alabama Trustee Implementation Group
BMP	best management practice
BP	BP Exploration and Production Inc.
BSNWR	Bon Secour National Wildlife Refuge
CFR	Code of Federal Regulations
DWH	Deepwater Horizon
DWH Trustees, Trustees	Deepwater Horizon Oil Spill Natural Resource Trustees
EA	Environmental Assessment
ECOS	Environmental Conservation Online System
E&D	engineering and design
EFH	Essential Fish Habitat
ERP	Early Restoration Plan
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
GEBF	Gulf Environmental Benefit Fund
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MAM	monitoring and adaptive management
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resource Damage Assessment
NRHP	National Register of Historic Places
OPA	Oil Pollution Act of 1990
PDARP/PEIS	Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement
RESTORE Act	Gulf Coast Ecosystem Restoration Council
RP I/EIS	Restoration Plan I/Environmental Impact Statement
RP II/EA	Restoration Plan II/Environmental Assessment
RP III/EA	Alabama Trustee Implementation Group Draft Restoration Plan III and Environmental Assessment: Provide and Enhance Recreational Opportunities, and Birds
TIG	Trustee Implementation Group

Trustee Council SOPs	2016 Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH oil spill
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDOI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WMA	Wildlife Management Area

Appendix B
Alabama Trustee Implementation Group Planning Summary

Restoration planning from the Deepwater Horizon (DWH) oil spill began in Alabama under Early Restoration, which included projects in four of the Early Restoration phases:

- Phase I:
  - Alabama Dune Restoration Cooperative Project - $1,480,000
  - Marsh Island (Portersville Bay) Marsh Creation - $11,280,000
- Phase II:
  - Enhanced Management of Avian Breeding Habitat Injured by Response in the Florida Panhandle, Alabama, and Mississippi - $4,658,118 (across three states)
  - Improving Habitat Injured by the Spill Response: Restoring the Night Sky - $4,321,165 (across Alabama and Florida)
- Phase III:
  - Alabama Swift Tract Living Shoreline - $5,000,080
  - Gulf State Park Enhancement Project - $29,221,693[1]
  - Alabama Oyster Cultch Restoration - $3,239,485
- Phase IV:
  - Bon Secour National Wildlife Refuge Trail Enhancement, Alabama - $545,110
  - Osprey Restoration in Coastal Alabama - $45,000
  - Point aux Pins Living Shoreline - $2,300,000
  - Shell Belt and Coden Belt Roads Living Shoreline - $8,050,000[2]

Following the 2016 settlement described in Section 1.1 of the RP III/EA and in Table B-1 (below), the AL TIG released its Final Restoration Plan I/Environmental Impact Statement: Provide and Enhance Recreational Opportunities (RP I/EIS). The final RP I/EIS was released April 2017. In September 2018, the AL TIG then released the second post-settlement restoration plan, Final Restoration Plan II and Environmental Assessment: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds; and Oysters (RP II/EA). RP I EIS identified six projects at a total cost of $70,675,000. RP II/EA identified 21 preferred projects in Baldwin and Mobile counties at a total cost of $31.8 million. Projects under both of these plans are listed below.

[1] $58.5 million of funds under the Phase III Gulf State Park Enhancement Project were enjoined (less the $2,216,388.21 spent prior to the injunction) by the court in Gulf Restoration Network v. Jewell et al. These funds then were evaluated in RP I/EIS under the Gulf State Park Lodge and Associated Public Amenities Project.

[2] ADCNR, as the implementing Trustee of the project, and the AL TIG determined that implementation of the project was not feasible because of changes at the proposed site and constructability issues. Therefore, the AL TIG discontinued the project.

Table B-1: Restoration Projects Under Restoration Plan I and Restoration Plan II

Restoration Projects	Restoration Plan	Project Allocation
Gulf State Park Lodge and Associated Public Access Amenities Project	I	$56,300,000
Fort Morgan Pier Rehabilitation	I	$3,075,000
Laguna Cove Little Lagoon Natural Resource Protection	I	$4,400,000
Bayfront Park Restoration and Improvement (Engineering and Design [E&D] only)	I	$1,000,000
Dauphin Island Eco-Tourism and Environment Education Area	I	$4,000,000
Mid-Island Parks and Public Beach Improvements (Parcels B and C)	I	$1,900,000
Magnolia River Land Acquisition (Holmes Tract)	II	$4,144,162
Weeks Bay Land Acquisition (East Gateway Tract)	II	$4,247,000
Weeks Bay Land Acquisition (Harrod Tract)	II	$3,606,900
Lower Perdido Islands Restoration Phase I (E&D Only)	II	$994,523
Southwestern Coffee Island Habitat Restoration Project, Phase I (E&D Only)	II	$825,225
Little Lagoon Living Shoreline	II	$210,999
Restoring the Night Sky: Assessment, Training, and Outreach	II	$183,003
Toulmins Spring Branch (E&D Only)	II	$479,090
Fowl River Nutrient Reduction	II	$1,000,000
Weeks Bay Nutrient Reduction	II	$2,000,000
Coastal Alabama Sea Turtle (CAST) Conservation Program	II	$935,061
CAST Triage	II	$622,915
CAST Habitat Usage and Population Dynamics	II	$1,631,696
CAST Protection: Enhancement and Education	II	$906,874
Enhancing Capacity for the Alabama Marine Mammal Stranding Network	II	$2,432,389

Restoration Projects	Restoration Plan	Project Allocation
Alabama Estuarine Bottlenose Dolphin: Protection Enhancement and Education	II	$686,374
Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health	II	$3,245,129
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment – Two Species	II	$1,547,500
Oyster Cultch Relief and Reef Configuration	II	$480,262
Side-scan Mapping of Mobile Bay Relic Oyster Reef (E&D Only)	II	$104,229
Oyster Hatchery at Claude Peteet Mariculture Center – High Spat with Study	II	$2,949,472
Oyster Grow-Out and Restoration Reef Place	II	$962,370

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Appendix C
Project Screening Methodology and Criteria

This appendix provides descriptions of the screening criteria developed by the Alabama Trustee Implementation Group (AL TIG) for recreational use and bird projects and the methodologies used to implement the screening for the AL TIG Restoration Plan III and Environmental Assessment: Provide and Enhance Recreational Opportunities, and Birds (RP III/EA).

Screening Criteria and Methodology for Recreational Use Projects

For the Recreational Use, the Programmatic Damage Assessment and Restoration Plan (PDARP) set out two goals for restoration:

- Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.
- Use education and outreach to promote engagement in restoration and stewardship of natural resources, which could include education programs, social media, and print materials.

The PDARP highlights nine restoration approaches relevant to Alabama for Recreational Use.

1. Enhance public access to natural resources for recreational use.
2. Enhance recreational experiences.
3. Promote environmental stewardship, education, and outreach.
4. Create, restore, and enhance coastal wetlands.
5. Restore oyster reef habitat.
6. Create, restore, and enhance barrier and coastal islands and headlands.
7. Restore and enhance dunes and beaches.
8. Restore and enhance submerged aquatic vegetation.
9. Protect and conserve marine, coastal, estuarine, and riparian habitats.

These goals and restoration approaches form the basis for the AL TIG's recreational use project development.

Tiering from RP I/EIS Screening

The recreational project screening process for RP III/EA tiered from the screening of recreation projects conducted for RP I/EIS (no further recreational project screening was conducted for RP II/EA). Separate approaches were applied for shoreline use and boating projects.

- **Shoreline Use Recreational Projects:** For shoreline use projects submitted prior to the development of RP I/EIS, the AL TIG assumed that previous decisions to not advance projects for implementation remained valid unless conditions that drove the decision had changed substantially. Such an approach made sense because the same screening criteria were adopted in RP III/EA for shoreline use projects as were used in RP I/EIS. For example, projects were not considered for RP III/EA that were not advanced during the RP I/EIS process because they (1) had no nexus to the spill, (2) were duplicative, or (3) were fully funded. In cases where projects

were not carried forward for other reasons (see RP I/EIS, Table 2-4 and projects in the final reasonable range of alternatives not selected as Preferred), the AL TIG reviewed each one to determine if the situation had changed enough to warrant reconsideration. Any projects meriting reconsideration were advanced directly to Step 2 below.

- **Boating Recreational Projects:** Since compensation for lost boating was not an objective of RP I/EIS, the only information from that screening process was the assignment of a project type to each portal submission. Projects with boating designations were determined to meet the eligibility screen for RP III/EA and were advanced directly to Step 2 below.

Screening Projects Submitted Since RP I/EIS

Step 1—Eligibility Screening

New project submissions received since RP I/EIS and by the TIG's requested RP III/EA deadline of January 25, 2019, entered the screening process at Step 1 Eligibility Screening. Projects were compiled from three sources:

- the Deepwater Horizon (DWH) public comment portal established in 2011—and in operation continuously since that date—to allow the public to submit projects for the DWH Trustees consideration;[1]
- a similar web-based public portal created in 2014 by the State of Alabama (Alabama Project Portal);[2] and
- projects developed by the DWH Trustees.

This initial eligibility screening involved AL TIG review to determine the objectives for each project in the master database (Appendix Y—RP III Master Project Database), followed by coding of each project according to its Restoration Type(s). All recreational use projects were also categorized according to the type of recreational activity (e.g., boating use or shoreline use) and the existence or non-existence of a nexus to the spill (Appendix Z—RP III Recreational Use Designations). In addition, the AL TIG identified projects that, while primarily focused on ecological restoration, had the potential to provide substantial shoreline or boating recreational benefits that would compensate for recreational services lost during the spill.

Step 2—Initial Project Screening Criteria

Using the set of projects identified through the Step 1 eligibility screening process, the AL TIG conducted an initial project screening based on goals related to the PDARP restoration types and the following criteria developed by the TIG.

1. Project (i) compensates for lost shoreline use; or (ii) project compensates for lost boating or boat fishing.
2. Project has strong nexus to injury caused by the spill. For shoreline use, this includes projects occurring at locations on or near the barrier island and ocean-facing beaches of Dauphin Island, Fort Morgan, Orange Beach and Gulf Shores. For boating and boat fishing,

[1] See http://www.gulfspillrestoration.noaa.gov/restoration/give-us-your-ideas/. This portal includes projects submitted in response to the December 2018 notice soliciting project ideas for this restoration plan—see https://www.gulfspillrestoration.noaa.gov/2018/12/alabama-trustee-implementation-group-welcomes-public-s-project-ideas-restoration-plan-iii.

[2] See http://www.alabamacoastalrestoration.org

all projects that provide boating access to Alabama's nearshore and coastal waters or that enhance the boating or boat fishing experience are considered to have a strong nexus.

3. Project focus is on **active** measures to meet the PDARP goals as opposed to research or monitoring activities.
4. Project is more appropriately conducted by the AL TIG than by a TIG implementing projects addressing a broader geographic scope (e.g., Open Ocean).
5. Project does not fund activities required by local, state or federal law, order, or permit.
6. Project is not already fully funded.
7. Project is not duplicative of other projects on the list.
8. Project must have adequate information for initial evaluation.

Projects that received a "yes" for all the above criteria (1 through 8) were carried forward to Step 3 below for more project specific screening.

Step 3--Project Specific Screening Considerations

After developing a 'short list' based on the application of the Step 2 criteria, more detailed information about projects was reviewed to evaluate the proposed scope in relation to a variety of project and site-specific considerations. Among the considerations for carrying the project forward the reasonable range of alternatives, the AL TIG evaluated the following:

1. Will the project effectively provide the type of compensation for lost natural resources that is proposed?
2. Do the project techniques have a reasonable likelihood of being implemented successfully?
3. Is the project consistent with existing management plans (e.g., watershed management plans or species recovery plans) and/or other previous efforts completed by federal, state, local, non-governmental agencies, or academic entities?
4. Can the project be implemented within the budget available for this restoration plan or is there a source of other funds that can be leveraged in conjunction with Natural Resource Damage Assessment (NRDA) funds available to allow implementation?
5. Is the project cost-effective?
6. Can the project be implemented in a reasonable time frame?
7. Does the project have a significant potential to result in adverse environmental, human health, or public safety impacts?
8. Are there any other impediments to carrying the project forward as part of the reasonable range of alternatives designated for more detailed Oil Pollution Act of 1990 (OPA) and National Environmental Policy Act (NEPA) analysis (e.g., compliance issues)?

Based on a balancing of the considerations outlined above, and in the context of the full suite of restoration alternatives being advanced for analysis in this restoration plan, the AL TIG made decisions about whether to advance projects to the reasonable range of alternatives. As a result, a project considered in Step 3 may have received a generally favorable review, but the TIG may still have decided not to advance it to the reasonable range of alternatives for this plan. The reason (or reasons) a project is not carried forward at this time are documented in the Administrative Record for this RP III/EA.

Bird Restoration Projects

The PDARP sets out three goals for bird restoration:

- Restore lost birds by facilitating additional production and/or reduced mortality of injured bird species.
- Restore or protect habitats on which injured birds rely.
- Restore injured birds by species where actions would provide the greatest benefits within geographic ranges that include the Gulf of Mexico.

The restoration approaches for birds include (1) restore and conserve bird nesting and foraging habitat; (2) create, restore, and enhance coastal wetlands; (3) restore and enhance dunes and beaches; (4) create, restore, and enhance barrier and coastal islands and headlands; (5) restore and enhance submerged aquatic vegetation; (6) protect and conserve marine, coastal, estuarine, and riparian habitats; (7) establish or re-establish breeding colonies; and (8) prevent incidental bird mortality.

Tiering from RP II/EA Screening

The bird project screening process for RP III/EA tiered from the screening of bird projects conducted for RP II/EA. For projects submitted prior to the development of RP II/EA, the AL TIG assumed that previous decisions to not advance projects for implementation remained valid unless conditions had changed. To make this determination, the AL TIG reviewed projects (1) in RP II/EA, Tables 12 and 13, and (2) projects that were not selected as Preferred from the final RP II/EA reasonable range of alternatives to identify bird projects meriting reconsideration in RP III/EA. Any such projects were advanced directly to Step 2 below.

Screening Projects Submitted Since RP II/EA

Step 1—Eligibility Screening

As with all the restoration types, project selection begins with identification of projects that have been submitted by the public that have been initially categorized as potentially targeting the restoration type under consideration.

Step 2—Initial Project Screening Criteria

Using the set of projects identified as providing bird restoration benefits from the portal project sorting, conduct a general eligibility screening based the AL TIG's goals related to the PDARP restoration type and the following criteria.

1. Project focus is on (i) increased reproduction or decreased mortality for DWH injured species; or (ii) filling important information/data gaps for birds in Alabama.
2. Project is more appropriately conducted by the AL TIG than by a TIG implementing projects addressing a broader geographic scope (e.g., Open Ocean).
3. Project has a reasonable likelihood of success.
4. Available information is sufficient to permit screening of the project.
5. Project does not fund activities required by local, state or federal law, order, or permit.
6. Project is not already fully funded.
7. Project is not duplicative of other projects on the list.

Projects that receive a "yes" for all the above criteria (1 through 7) would be carried forward to Step 3 below for more project specific consideration.

Step 3—Project Specific Screening Considerations

After developing a "short list" based on the application of the above criteria, each project would be reviewed to evaluate the proposed scope in relation to a variety of project specific considerations. Among the considerations would be:

1. From a restoration or data gap perspective, how significant are the project benefits?
2. Can the project be implemented within the budget available for this restoration plan or is there a source of other funds that can be leveraged in conjunction with NRDA funds available to allow implementation?
3. Is the project cost-effective?
4. Can the project be implemented in a reasonable time frame?
5. Does the project have a significant potential to result in adverse environmental or human health impacts?
6. Are there any other impediments to carrying the project forward as part of the reasonable range of alternatives designated for more detailed OPA and NEPA analysis (e.g., compliance issues)?

Based on a balancing of the considerations outlined above, and in the context of the full suite of restoration alternatives being advanced for analysis in this restoration plan, the AL TIG made decisions about whether to advance projects to the reasonable range of alternatives. As a result, a project considered in Step 3 may have received a generally favorable review, but the TIG may still have decided not to advance it to the reasonable range of alternatives for this plan. The reason (or reasons) a project is not carried forward at this time are documented in the Administrative Record for this RP III/EA.

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Appendix D
Rationale for Not Carrying Projects Forward

Table D-1: Shoreline Use Recreational Projects Not Carried Forward from Step 2 to Step 3 Analysis

Shoreline Use Recreation Projects Not Carried Forward from Step 2 to Steps 3 Analysis	Project ID	Organization/Individual	Project Cost	Rationale for Not Carrying Forward
Gulf Place Development	Fed-631	City of Gulf Shores/Brandan Franklin	$2,500,000	Project already fully funded.
Fort Morgan Parkway Trail Extension	Al-359	State Parks Division, ADCNR/Rob Grant	$4,433,600	Project already fully funded.
New RV Campground Facilities at Gulf State Park	Al-364	State Parks Division, ADCNR/Rob Grant	$2,500,000	Project already fully funded.
Ambassadors of the Environment Program - Gulf Shores	Al-322	City of Gulf Shores/Dan Bond	$13,500,000	Project already fully funded.
Dauphin Island West End Acquisition	Al-348	Mobile Baykeeper/Casi Callaway	$10,050,000	Project is being considered as a Bird project.
Magnolia River North Gateway Tract	Al-337	Weeks Bay Foundation/Yael Girard	$2,000,000	Project lacks a shoreline geographic nexus. Section 2.4.1. Not considered for a boating project due to the availability of other public boat launches in the area.
Long Bayou and Portage Creek Preservation and Enhancement	Fed-13835	City of Orange Beach/Wade Stevens	$18,300,000	Duplicates work of Project Al-431.
Gulf State Park Pier Renovations	Fed-12844	Gulf State Park/Lisa Laraway Atchley	$500,000	Duplicates work of Project Al-447.
Deepwater Sand Search	Fed-12876	City of Orange Beach/Phillip West	$500,000	Project is not an active measure but is instead a planning study.
Improving Public Access to Alabama Coastal Waters-Viewpoint Park Public Access	Fed-11785	Weeks Bay Foundation/Walter C. Ernest, IV	$810,000	Project lacks a shoreline geographic nexus. See Section 2.4.1
Gulf State Park Romar Beach Public Restroom Facility	Fed-12874	City of Orange Beach/Phillip West	$375,000	Duplicates work of Project Al-366.
Perdido Pass Sea Wall Rebuild	Fed-12879	City of Orange Beach/Wade Stevens	$6,200,000	Duplicates work of Project Al-384.
Weeks Bay East Gateway Project	Fed-12838	Weeks Bay Foundation/Yael Girard	$3,000,000	Project already fully funded.
New Museum and Visitor Center at Fort Morgan	Al-301	Alabama Historical Commission/Lisa D. Jones	$4,000,000	Duplicates work of Project Al-444.
Mobile Point Lighthouse Repair and Restoration	Al-302	Alabama Historical Commission/Lisa D. Jones	$382,890	Duplicates work of Project Al-443.
Restoration of Peace Magazine	Al-303	Alabama Historical Commission/Lisa D. Jones	$300,000	Duplicates work of Project Al-443.
Restoration of the Lighthouse Keeper's House	Al-304	Alabama Historical Commission/Lisa D. Jones	$495,680	Duplicates work of Project Al-443 and Al-444.
Isle Dauphine Beach and Golf Study	Al-324	Dauphin Island Properties Owners Association/Marc Whitehead	$375,000	Project is not an active measure but is instead a feasibility study.
Gulf State Park Pier Renovation	Al-357	State Parks Division, ADCNR/Rob Grant	$1,000,000	Duplicates work of Project Al-447.
Phased Recreation Facilities Development at Meaher State Park	Al-361	State Parks Division, ADCNR/Rob Grant	$3,450,000	Project lacks a shoreline geographic nexus. See Section 2.4.1.
Lower Dog River Bottomland Hardwoods Protection	Al-343	Dog River Clearwater Revival/Debi Foster	$1,802,500	Project lacks a shoreline geographic nexus. See Section 2.4.1.
Mobile Bay Western Shore Acreage	Al-371	Bay Area Properties, LLC, Real Estate Brokerage/Logan Green	$6,600,000	Project lacks a shoreline geographic nexus. See Section 2.4.1.

Shoreline Use Recreation Projects Not Carried Forward from Step 2 to Steps 3 Analysis	Project ID	Organization/Individual	Project Cost	Rationale for Not Carrying Forward
Restoration and Debris Removal of Bayou Sara and Norton Creek	Al-402	City of Saraland/Matthew Lambert	$1,000,000	Project lacks a shoreline geographic nexus. See Section 2.4.1.
St Andrews Bay/Pilot Town Recreation Area and Kayak Launch	Fed-14079	Fort Morgan Civic Association/Joe Emerson	$5,000,000	Duplicates work of Project Al-439.
Fort Morgan Alabama Addition to Bird and Wildlife Federal Land	Fed-13840	Johnie Henry Kuglar Trust/John Kuglar	NA	Duplicates work of Project Fed-13837.
Conservation of Upper Three Mile Creek Watershed	Al-309	NA/Thomas Root	$93,000	Project lacks a shoreline geographic nexus. See Section 2.4.1.
Mobile Greenway Initiative	Al-329	City of Mobile/Keri Coumanis	$11,000,000	Project lacks a shoreline geographic nexus. See Section 2.4.1.
Strategic Floodplain Acquisitions	Al-411	City of Mobile/Keri Coumanis	$5,000,000	Project lacks a shoreline geographic nexus. See Section 2.4.1.
Working Waterfront and Greenspace Restoration Project	Al-332	City of Fairhope/Kain Wilson	$6,200,000	Project lacks a shoreline geographic nexus. See Section 2.4.1. Also, project is focused on tourism promotion rather than shoreline recreational use. Therefore, it would not provide sufficient benefit to general shoreline recreational use or the users affected by the DWH oil spill.
Gulf Coast Exploreum Downtown Mobile Tourism Impact Project	Fed-13737	Gulf Coast Exploreum Science Center/Jan McKay	$2,500 ,000	Project lacks a shoreline geographic nexus. See Section 2.4.1. Also, project is focused on tourism promotion rather than shoreline recreational use. Therefore, it would not provide sufficient benefit to general shoreline recreational use or the users affected by the DWH oil spill.
GulfQuest Deck 4 Exhibits Completion	Al-298	GulfQuest (National Maritime Museum of the Gulf of Mexico)/Tony Zodrow	$809,195	Project lacks a shoreline geographic nexus. See Section 2.4.1. Also, project is focused on tourism promotion rather than shoreline recreational use. Therefore, it would not provide sufficient benefit to general shoreline recreational use or the users affected by the DWH oil spill.
Gulf Coast Exploreum Downtown Mobile Tourism Impact Project	Al-392	Gulf Coast Exploreum Science Center/Jan McKay	$2,500,000	Project lacks a shoreline geographic nexus. See Section 2.4.1. Also, project is focused on tourism promotion rather than shoreline recreational use. Therefore, it would not provide sufficient benefit to general shoreline recreational use or the users affected by the DWH oil spill.

Table 2-2: Shoreline Use Recreational Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives

Shoreline Recreational Use Projects Not Carried Forward From Steps 3 to Reasonable Range of Alternatives	Project ID	Organization/Individual	Project Cost	Rationale for Not Carrying Forward
Historic Barracks Museum and Lodging	Al-444	Fort Morgan State Historic Site/Heather Tassin	$7,040,000	Project primarily supports historic preservation rather than beach and shoreline use recreational activities injured due to the spill.
Fort Morgan and Mobile Point Recreational and Habitat Enhancement	Al-443	Fort Morgan State Historic Site/Heather Tassin	$4,381,000	Project primarily supports historic preservation rather than beach and shoreline use recreational activities injured due to the spill.
New Pier at Alabama/Florida Point (Gulf State Park)	Al-365	State Parks Division, ADCNR/Rob Grant	$25,000,000	Project proponent is not currently interested in pursuing NRDA funding for the project.
Little Lagoon Restoration Project	Al-401	City of Gulf Shores/Dan Bond	$5,995,686	Project has been approved for funding by the AL Council for RESTORE Bucket 3.
Fort Morgan Alabama Addition to Bird and Wildlife Federal Land	Fed-13837	Johnie Henry Kuglar Trust/John Kuglar	NA	Project does not provide a high-quality recreational opportunity given its location, size, and lack of connectivity to recreational trails.
Mountains to Ocean Marine Ecosystem Immersion	Fed-14065	One World Adventure/Angie Shugart	$20,000	Project does not have a strong shoreline use nexus to the spill--a substantial portion of the funding for this small project is for activities in upland areas of northern Alabama.
Wetlands Education Project	Fed-13419	Audubon Nature Institute/Gina Trapani	$800,000	Project is focused on Louisiana and is therefore is not a focus of the Alabama TIG.
PO Isle Dauphine Beach Restoration	Al-403	Dauphin Island Property Owners Association/Earle Walkley	$600,000	Project is deferred for consideration until the Isle Dauphin feasibility study (RESTORE Bucket 1 project) is completed.
Beach Club West	Al-340	Fort Morgan Paradise Joint Venture/Drew Niederriter	$30,845 ,000	Costs exceed budget for this restoration plan.
Long Bayou and Portage Creek Preservation and Enhancement	Al-431	City of Orange Beach/Wade Stevens	$16,000,000	Project is high cost and is primarily an ecological project. Any shoreline recreational use benefits are indirect and difficult to estimate.
Expansion of Beach Access Areas - Cotton Bayou & Romar Beach - Gulf State Park	Al-366	State Parks Division, ADCNR/Rob Grant	$5,800,000	Project proponent is not currently interested in pursuing NRDA funding for the project.
St Andrews Bay/Pilot Town Recreation Area and Kayak Launch	Al-439	Fort Morgan Civic Association/Joe Emerson	$5,000,000	The AL TIG determined that advancing this project to the reasonable range is not the best use of restoration funds when considered in the context of other recreational use projects advanced for analysis in the RP III/EA together with those projects selected for implementation in previous restoration plans.
Hunter Marina Property, Aloe Bay	Al-450	Town of Dauphin Island	$4,065,000	Project proponent is not currently interested in pursuing NRDA funding for the project.

Table D-3: Recreational Boating Projects Not Carried Forward from Step 2 to Steps 3 Analysis

Recreational Boating Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Organization/Individual	Project Cost	Rationale for Not Carrying Forward
Nearshore and Snorkeling Reef Project	Fed-396	City of Orange Beach/Phillip West	$500,000	Project already funded.
Alabama Point Seawall Restoration	Al-384	City of Orange Beach/Phillip West	$2,500,000	Project already funded.
Perdido River and Bay Paddle Trail & Boating Improvements	Fed-12799	Escambia County/Chips Kirschenfeld	$6,000,000	Duplicates work of Perdido River Land Acquisition and Recreational Boating Project (Molpus) analyzed herein as part of the reasonable range of alternatives.
Perdido River Water Quality Protection, Habitat Restoration and Recreational Enhancement Project	Al-318	The Nature Conservancy/ Darryl Boudreau	$14,220,000	Duplicates work of Perdido River Land Acquisition and Recreational Boating Project (Molpus) analyzed herein as part of the reasonable range of alternatives.
Outreach, Implementation and Assessment: Using Descending Devices to Reduce Post-release Mortality of Reef Fishes in the Gulf of Mexico Recreational Fishery	Fed-13511	NOAA Fisheries Southeast Fisheries Science Center/Kenneth Brennan	$4,550,000	Project may be more appropriately conducted by a TIG implementing projects addressing a broader geographic scope.

Table D2-4: Recreational Boating Projects Not Carried Forward From Steps 3 to Reasonable Range of Alternatives

Recreational Boating Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives	Project ID	Organization/Individual	Project Cost	Rationale for Not Carrying Forward
Boggy Point Boat Launch Public Restroom	Fed-12873	City of Orange Beach/Phillip West	$458,000	Project deferred pending completion of the AL TIG RP II/EA Lower Perdido Islands Restoration Phase I project, concern for public safety issues associated with a floating restroom at this location, and potential evaluation of other locations and lower maintenance technologies.
Perdido Bluff	Al-395	Weeks Bay Foundation/Yael Girard	$17,250,000	Costs exceed budget for this restoration plan.
Baldwin County ICW Boat Launch	Al-423	Baldwin County Commission/Joey Nunnally	$10,312,500	High cost, complex project with potential permitting and public safety issues.
Town of Perdido Beach Shoreline Restoration Project	Fed-595	Town of Perdido Beach/Patsy Parker	$6,000,000	Project is primarily an ecological project and not a recreational boating project.
Shoreline Restoration on Ft. Morgan Peninsula - Pine Public Access Boat Ramp	Fed-422	Volkert, Inc./Paul Looney	$13,500,000	Project is high cost with limited options for parking, and therefore is not expected to be cost-effective. Costs exceed budget for this restoration plan.
Artificial Reef Creation off the Alabama Coast	Fed-13360	ADCNR/Chris Blankenship	NA	Project proponent is not currently interested in pursuing NRDA funding for the project.
Old River Recreation Access Area - Gulf State Park	Al-355	State Parks Division, ADCNR/Rob Grant	$4,500,000	Project proponent is not currently interested in pursuing NRDA funding for the project.

Table D-5: Bird Projects Not Carried Forward from Step 2 to Step 3 Analysis

Bird Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Maximizing Restoration Impacts Using Full Annual Cycle Models for Migratory Bird Populations Injured in the Deepwater Horizon Oil Spill	Fed-13388	Migratory Bird Center, Smithsonian Conservation Biology Institute/Emily Cohen	$611,689	Project may be more appropriately conducted by a TIG implementing projects addressing a broader geographic scope.
Expanding seabird observer placements in support of the Gulf of Mexico Marine Assessment Program for Protected Species (GoMMAPPS)	Fed-13163	Terra Mar Applied Sciences, LLC/J. Christopher Haney, Ph.D.	$72,436	Project is already funded.
Benthic Invertebrate Community Response and Recovery Rates following Barrier Shoreline Restoration Projects and Potential Impacts to the Habitats of the Threatened Piping Plover and Other Wintering and Migratory Shorebirds	Fed-12851	USGS/Scott Mize	$750,000	Project is solely a research activity and does not include active measures that directly restore bird populations injured by the spill.

Table D-6: Bird Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives

Bird Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Long term acoustic monitoring of colonial waterbirds and shorebirds	Fed-13225	CSA Ocean Sciences/Mary Jo Barkaszi	$580,000	Duplicative with the AL TIG RP II/EA Colonial Nesting Wading Bird Tracking and Habitat Use Assessment – Two Species project.
Restoration of Beach-nesting Birds on Federal Lands in the Western Panhandle of Florida and Alabama	Fed-13319	American Bird Conservancy/Kacy Ray	$1,219,438	Proposed activity is merged into Stewardship of Coastal Alabama Beach Nesting Bird Habitat being considered in the reasonable range of alternatives herein.
Restoration of Piping Plover and other overwintering shorebirds through reductions in anthropogenic stressors	Fed-13870	US Fish and Wildlife Service/Jeff Gleason	$2,000,000	Project does not meet TIG goals as effectively as projects focused on stewardship of beach nesting bird habitat.
Coyote Removal to Benefit Beach-nesting Birds & Adult Snowy Plover Survivorship Analyses	Al-448	American Bird Conservancy/Kacy Ray	$153,000	Proposed activity is merged into Stewardship of Coastal Alabama Beach Nesting Bird Habitat being considered in the reasonable range of alternatives herein.
Comprehensive stewardship of breeding waterbirds across barrier and nearshore islands in the Gulf (Alabama–Texas)	Fed-13314	National Audubon Society/Melanie Driscoll	$10,000,000	Proposed activity is merged into Stewardship of Coastal Alabama Beach Nesting Bird Habitat being considered in the reasonable range of alternatives herein.
Coastal Alabama Habitat Restoration - Mobile Bay Bird Islands	Fed-358	Volkert, Inc./Paul Looney	$10,000,000	No specific island projects were proposed that could be advanced for further project development.
Population, Nesting Colony, and Foraging Range Assessments of Breeding Colonial Waterbirds on Gaillard Island, Cat, and Terrapin/Coffee islands, Alabama	Fed-13697	American Bird Conservancy/Kacy Ray	$1,003,795	Duplicative with the AL TIG RP II/EA Colonial Nesting Wading Bird Tracking and Habitat Use Assessment – Two Species project.
Bon Secour National Wildlife Refuge Acquisition Phase III - Pilot Town	Al-440	The Nature Conservancy/Judy Haner	$6,869.177	Project would provide some services to injured bird species, namely to foraging birds. However, the price of acquisition is not cost effective solely to obtain these benefits.

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Appendix E
Consolidated MAM Plans

INTRODUCTION

Implementation of Monitoring and Adaptive Management (MAM) was identified as one of the programmatic goals in the *Deepwater Horizon* (DWH) oil spill Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS). The DWH NRDA MAM Framework provides a flexible, science-based approach to effectively and efficiently implement restoration over several decades that provides long-term benefits to the resources and services injured by the DWH spill. Monitoring and adaptive management (MAM) are major responsibilities for the Alabama TIG (AL TIG). As described in the PDARP (section 7.5.1), TIGs are responsible for both resource- and project-level MAM activities. The AL TIG has developed and will implement MAM plans for all restoration projects consistent with guidance provided in the Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. The project MAM plans that follow in these appendices identify the monitoring needed to evaluate progress toward meeting project objectives and to support adaptive management of each restoration project. These plans identify key sources of uncertainty, incorporate monitoring data needs and decision points that address these uncertainties, and establish a decision-making process for making project adjustments, if needed. Data generated through monitoring will provide the basis for annual project reporting and support the five-year programmatic reporting, which keeps the public fully informed about restoration progress. Monitoring data will also be incorporated into future project planning activities to improve the likelihood of success and benefits of future projects. MAM plans are living documents which will be updated as needed to reflect changing conditions and/or new information. For example, a plan may need to be revised if the project design changes, if initial data analysis indicates that the sampling design is inadequate, or if any uncertainties are resolved or new uncertainties are identified during project implementation and monitoring. Any significant future revisions to MAM plans will be made publicly available through the DIVER Restoration Portal.

All of the preferred projects in this Plan have an associated MAM plan, which follow below. MAM Plans are consistent with the MAM Manual. The content of each MAM Plan depends on the type of project and the level of uncertainty associated with the implementation of the proposed activities.

There are three primary purposes of MAM Plans:

1. The first purpose is to identify how restoration managers will measure and track progress towards achieving restoration goals and objectives. This work is accomplished via monitoring specific parameters that, individually and collectively, help the AL TIG understand the extent to which a project is achieving its restoration objectives.
2. The second purpose is to increase the likelihood of successful implementation through identification, before a project begins, of potential corrective actions that could be undertaken if a project does not proceed as expected. This is accomplished by conceptually outlining project uncertainties and responses by the implementing Trustee and/or the AL TIG that might be undertaken to correct these problems.
3. The third purpose is to capture in a systematic way lessons learned or new information acquired that can be incorporated into future project selection, design, and implementation. The evaluation section of each MAM plan contains basic questions that the AL TIG will answer to help understand whether a project achieved its objectives, and whether any unanticipated issues were encountered

during implementation and how such issues were addressed. Such information will provide insights for future project development. This section will be updated with additional information as monitoring methods are determined for each project. In the future, the AL TIG will work to identify ways to evaluate the overall success of their DWH restoration work by incorporating feedback from project-level evaluations into a larger resource-level framework to understand how projects could be expected to contribute collectively to restoration of injured resources and improved ecosystem conditions and function along the Alabama coast.

The Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0 provides detailed information regarding the importance and use of adaptive management.

E-1: MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT
Perdido River Land Acquisition (Molpus Tract)

1. PROJECT OVERVIEW

This project would acquire and place in conservation 1,391 acres of coastal habitat on the Perdido River. Originally considered in the AL TIG RP II/EA, the project was not carried forward as a Wetlands, Coastal, and Nearshore project. The project was revisited and determined to be more appropriate for the Provide and Enhance Recreational Opportunities Restoration Type. The Molpus Tract covers more than 4 miles of riverfront on the Perdido River and is immediately south of and contiguous with the Perdido Wildlife Management Area (WMA). Of the 1,391 acres proposed for purchase, approximately 686 acres are upland, and 705 acres are wetland. ADCNR would own and manage the land. Management would include hydrologic restoration as needed and the use of clearing and prescribed burns over time to returning the appropriate acreage to longleaf pine.

The project would include recreational improvements to the property, including a canoe/kayak launch that would link this property to the Perdido River Canoe Trail and provide an additional point of access to the river for the public (ADCNR 2019). Signage educating the public about the area's flora and fauna, the Perdido WMA, and the Perdido River Canoe Trail would also be developed and installed near the launch. Acquisition of the Molpus Tract is strategic because it would place large amounts of acreage into conservation. When considered holistically with publicly held land on the Alabama and Florida sides of the Perdido River, it is an important acquisition in the ongoing effort to place the Perdido River corridor in conservation

1.2 Restoration Type Goals and Project Restoration Objectives

- **Programmatic Goal:** Provide and enhance recreational opportunities.
- **Restoration Type:** Provide and enhance recreational opportunities.
- **Restoration Type Goal:** Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.
- **Restoration Approaches:** Enhance Recreational Experience. Enhance public access to natural resources for recreational use.
- **Restoration Technique(s):** Acquire land to serve as public access points. Enhance or construct infrastructure.

Objective 1: Acquire tract of land.

Objective 2: Construct and complete project as scoped.

Objective 3. Manage site for recreational use and natural resources.

1.3 Conceptual Setting and Anticipated Outcomes

A conceptual model 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 outcome.

Table 1: Conceptual Model

Activity	Output	Short-term Outcome	Long-term Outcome
Acquisition of Tract	Tract is acquired.	Additional acreage is available for public use and enjoyment, conservation purposes.	• The public is able to use the amenities as designed. • Visitation to the tract increases.
Complete construction of infrastructure improvements and amenities (kayak launch and parking area).	Infrastructure is completed, and the amenities are utilized.	New infrastructure and amenities function as designed.	

1.4 Sources of Uncertainty

Drivers are outside forces, natural or anthropogenic, that have the potential to influence the outcomes of a restoration project (DWH NRDA Trustees 2017, Section E.6.3). Drivers tend to be large-scale, long-term forces that are not easily controlled at the scale of a single restoration project (Harwell et al. 2016).

When evaluating the proposed project, the following outside drivers and stressors were considered:

- Development and changes in land use
- Human attachment to or interest in recreational activities
- Frequency and intensity of storm events
- Public interest or need

This list should not be considered exhaustive; additional drivers may be identified as the project is implemented and/or monitored. These drivers may affect the achievement of the restoration goals and objectives of the project. If any drivers are negatively impacting the project, adaptive management may be necessary to ensure the project's goals and objectives are being achieved. The adaptive management strategy for the project is outlined below.

Project uncertainties, or information gaps, have the potential to affect adaptive management decisions for restoration projects, such as how to improve the likelihood of achieving the goals and objectives of the project, or identifying corrective actions if the project is not performing as intended.

When evaluating this recreational use project, the following uncertainties were considered:

- Increased use of the area
- Ability to attract public use of the area
- Potential need for ecological restoration (e.g., as a result of increased use of the area)

This list should not be considered exhaustive; additional uncertainties could be identified as the project is implemented and/or monitored. During the planning phase of the project, it was assumed that the improvements to the parcel and the construction of the kayak launch and parking areas would attract increased public use of the area and associated Perdido Canoe Trail. This project connects to the Perdido WMA, thus impacts to the human community are not expected. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this draft RP III/EA.

2. PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives. The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter 1: Acquisition of Parcel.

a. Purpose: To verify acquisition of tract.

b. Method: Submission of executed acquisition documents, such as a deed.

c. Timing and Frequency: Once upon completion of acquisition.

d. Sample Size: NA

e. Sites: Molpus Tract.

f. Performance Criteria: Executed acquisition document.

g. Corrective Action(s): N/A

Parameter 2: Infrastructure constructed and/or enhanced and completed as designed.

a. Purpose: On-site monitoring will be conducted during construction to ensure amenities are constructed according to plans and to ensure that construction activities comply with the full set of environmental permit conditions.

b. Method: Project implementor to review contractor reports, conduct on-site inspections as needed, and compare to construction drawings.

c. Timing and Frequency: Approximately monthly and at end of project unless otherwise provided by contract. The construction elements of the project are expected to be completed within a 12-month time frame (after acquisition).

d. Sample Size: Approximately 12 (once per month for 12 month) unless otherwise provided by contract.

e. Sites: Molpus Tract.

f. Performance Criteria: Project amenities (kayak launch, parking areas) are constructed as designed and specified in the contract.

g. Corrective Action(s): Resolution with contractor such that the terms of the contract are met.

Parameter 3: Area

a. Purpose: Determine area of habitat and recreational property acquired.

b. Method: Information provided from purchase documents and/or survey.

c. Timing and Frequency: Once upon completion of acquisition.

d. Sample Size: Entire tract.

e. Sites: Molpus Tract.

f. Performance Criteria: 1,391 acres acquired

g. Corrective Action(s): NA

Parameter 4: Visitor use/access

a. Purpose: To estimate number of members of the public that are able to access and are using the site.

b. Method: Visual observation and/or use of automated counters

c. Timing and Frequency: Four days during months of May-October for 3 years following construction completion.

d. Sample Size: 12 surveys total

e. Sites: Parking area/kayak launch at Molpus Tract

f. Performance Criteria: Members of the public are able to use the amenities constructed/enhanced.

g. Corrective Action(s): Evaluate reason(s) the public may not be able to access the infrastructure and/or improvements and/or are not using them to the desired potential and correct those issues. A visitor satisfaction survey may be conducted to perform evaluation.

The schedule for project monitoring is shown in Table 2, separated by monitoring activity. Pre-execution monitoring will occur before project execution. As-built monitoring occurs when project has been fully executed as planned. Project/Performance monitoring will occur in the years following initial project execution.

Table 2: Monitoring Schedule

Monitoring Parameter	Objective(s)	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-3)
Acquisition of Parcel	**1**			
Infrastructure constructed and/or enhanced and completed as designed.	**2**		**X**	
Area	**1**		**X**	
Visitor use/access	**3**			**X**

3. ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. Adaptive management should not be used for projects where learning is unlikely, where decisions are irreversible, or where no opportunity exists to revise or reevaluate decisions based on new information (Doremus et al. 2011).

The project proposes to use standard engineering specifications and tried-and-tested construction methodology for constructing the improvements. The alternative's goal of enhancing recreational boating opportunities while protecting, conserving, and initiating the restoration of the Perdido River property has a high likelihood of success. The land has a willing seller, and it is anticipated that negotiations would lead to its acquisition at a reasonable price. Land acquisitions of this type are a proven approach for achieving the types of conservation goals identified by the AL TIG for this property. ADNCR has implemented similar canoe and kayak infrastructure projects in the past. The fact that this one connects to the more extensive Perdido River Blueway Trail further increases the likelihood of attracting canoeists and kayakers to the area. The proposed restoration techniques (e.g., clearing, thinning, and conducting prescribed burns and hydrologic restoration) have been successfully implemented for recreating longleaf pine habitat capable of supporting a more diverse range of native flora and fauna. Finally, ADCNR, which would hold title to the property, manage the restoration and provide future maintenance, already successfully manages numerous other properties similar to this one, including the Perdido Wildlife Management Area into which this tract is proposed to be merged. For these reasons, significant adaptive management is not included in this MAM plan. However, if monitoring determines that the project is not meeting its goals and objectives, then corrective actions should be used. Suggested corrective actions, if appropriate, are described above in Section 2.

4. EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed. As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project objectives achieved? If not, is there a reason why they were not met?
- Did project activities undertaken produce unanticipated effects?

- Were there unanticipated events unrelated to the project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan will be made if needed.

5. DATA MANAGEMENT

5.1 Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 (DWH NRDA Trustees 2017). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field 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. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file 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 will be made and the original preserved.

5.2 Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks and would make any corrections to transcription errors as appropriate before data are used 8 for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

5.3 Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

5.4 Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and

state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

6. REPORTING

Annual MAM reports will be developed in accordance with Appendix E in the MAM Manual, describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface. A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

7. ROLES AND RESPONSIBILITIES

ADCNR is the Implementing Trustee agency for this project and will ensure that the project is completed and implemented. ADCNR will be responsible for monitoring progress towards each parameter and will provide regular reports documenting the progress and results of each parameter. Reports provided by ADCNR will be qualitative and quantitative and will be in a format which is easily interpreted and transcribed into DIVER at least annually and in accordance with Section 5, above.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

8. REFERENCES

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9. MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name

E-2: MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT
Bayfront Park Restoration and Improvements Project – Phases IIa and IIb

1. PROJECT OVERVIEW

Bayfront Park is a publicly accessible outdoor recreation area located on Dauphin Island Parkway near the Alabama Port community. Phase I for this project included funds for engineering and design (E&D) work to develop the concept to enhance Mobile County's Bayfront Park and was funded by the AL TIG RP I/EIS Bayfront Park Restoration and Improvement (E&D only) project. The resulting master plan broke down construction activities into two phases, hereby known as Phases IIa and IIb. The project described in the Draft RP III/EA would implement Phases IIa and IIb of shoreline recreational improvements developed under Phase I at Bayfront Park on Dauphin Island Parkway near the Alabama Port community. Enhancements would facilitate public access and improve recreational amenities. The 20-acre park, operated by the Mobile County Commission, currently receives more than 300 visitors on weekends and more than 1,200 visitors per week during the peak summer months. Recreational activities currently supported at this site include biking, playground use, fishing and crabbing, picnicking, walking, exercising, paddle sports such as kayaking, and bird watching. The park provides public access to Mobile Bay and other public amenities, such as a playground, picnic areas, and restrooms. The park also provides public access to the shoreline. The Mobile County Commission owns, maintains, and staffs the park. This project would fund implementation and construction of a number of shoreline and amenity improvements in the park. Phases IIa and IIb would include the work proposed here, including construction of several park amenity improvements and a pocket beach. The proposed amenities under Phases IIa and IIb are described. ADCNR would serve as the implementing Trustee for this project.

Located in Mobile County on Dauphin Island Parkway, Bayfront Park is an approximately 20-acre existing park with public access to Mobile Bay and other public amenities, such as a playground, picnic areas, and restrooms. Approximately 50 percent of the park is estuarine wetland. The park is owned, maintained, and staffed by the Mobile County Commission. This project would fund implementation and construction of a number of shoreline and amenity improvements in the park.

Proposed Infrastructure/Improvements. This project proposes to fund the Phases IIa and IIb construction of several amenities that would include:

Phase IIa:

- Stabilizing and constructing an approximately 10-acre sand pocket beach in front of existing riprap with breakwaters and groins to be added if advised by a coastal engineer.
- Constructing civil work, including crushed aggregate access roads, concrete parking pads including Americans with Disabilities Act (ADA)-compliant parking and sidewalks for ADA-compliant access; concrete apron at the park entry as required by the Alabama Department of Transportation; and beach overlooks.
- Updating and replacing playground equipment with a new pavilion.
- Constructing new restroom facilities, including demolishing the existing restroom facility and replacing it with ADA-compliant restrooms and a park office that would be used only by the Mobile County staff who are managing the park.

Phase IIb:

- Replacing and expanding the footprint for existing boardwalk with overlooks, with a proposed dimension of approximately 2,250 linear feet.
- Adding additional crushed aggregate and concrete walkways and concrete for additional ADA-compliant parking.

1.1 Restoration Type Goals and Project Restoration Objectives

- **Programmatic Goal:** Provide and enhance recreational opportunities.
- **Restoration Type:** Provide and enhance recreational opportunities
- **Restoration Type Goal:** Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.
- **Restoration Approaches:** Enhance Recreational Experience. Enhance public access to natural resources for recreational use.
- **Restoration Technique(s):** Enhance or construct park infrastructure.

Objective 1: Enhance public access through infrastructure development.

Objective 2: Stabilize shoreline and create pocket beach area to provide access to water and protect constructed amenities.

1.2 Conceptual Setting and Anticipated Outcomes

A conceptual model 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 outcome.

Table 1: Conceptual Model

Activity	Output	Short-term Outcome	Long-term Outcome
Complete construction of infrastructure improvements and amenities.	Infrastructure is completed and the amenities are utilized.	New infrastructure functions as designed.	• The public is able to use the amenities as designed. • Visitation to Bayfront Park increases.

1.3 Sources of Uncertainty

Drivers are outside forces, natural or anthropogenic, that have the potential to influence the outcomes of a restoration project (DWH NRDA Trustees 2017: Section E.6.3). Drivers tend to be large-scale, long-term forces that are not easily controlled at the scale of a single restoration project (Harwell et al. 2016).

When evaluating the proposed project, the following outside drivers and stressors were considered:

- Development and changes in land use
- Human attachment to or interest in recreational activities
- Frequency and intensity of hurricanes
- Sea level rise

- Public interest or need

This list should not be considered exhaustive; additional drivers may be identified as the project is implemented and/or monitored. These drivers may affect the achievement of the restoration goals and objectives of the project. For example, if the intensity and frequency of hurricanes increase in the region, or if there is an increase in the rate of sea level rise, the pocket beach may need to be renourished to withstand the new environmental conditions. If any drivers are negatively impacting the project, adaptive management may be necessary to ensure the project's goals and objectives are being achieved. The adaptive management strategy for the project is outlined below.

Project uncertainties, or information gaps, have the potential to affect adaptive management decisions for restoration projects, such as how to improve the likelihood of achieving the goals and objectives of the project, or identifying corrective actions if the project is not performing as intended.

When evaluating this recreational use project, the following uncertainties were considered:

- Increased use of the area
- Ability to attract public use of the park
- Potential need for ecological restoration (e.g., as a result of increased use of the area)
- Potential impact on local community (e.g., noise related to having too many visitors, trash).

This list should not be considered exhaustive; additional uncertainties could be identified as the project is implemented and/or monitored. Mobile County will maintain the park and provide personnel to reduce likelihood of potential impacts on the local community (e.g., nuisance noise). During the planning phase of the project, it was assumed that the improvements to the park and the construction of the pocket beach would attract increased public use of the park. Implementation of the alternative is not expected to cause any net collateral damage to the environment. Construction of shoreline improvements, however, is contingent on the completion of modeling to determine final design/placement of materials to prevent negative impacts on adjacent shorelines and/or sediment transport. This is discussed more fully in Chapter 4 of this draft RP III/EA.

2. PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS, AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives. The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter 1: Infrastructure and habitat constructed and/or enhanced and completed as designed.

a. Purpose: On-site monitoring will be conducted during construction to ensure improvements are constructed according to plans and to ensure that construction activities comply with the full set of environmental permit conditions.

b. Method: Project implementor to review contractor reports, conduct on-site inspections as needed, and compare to construction drawings.

c. Timing and Frequency: Approximately monthly and at end of project unless otherwise provided by contract. The project is expected to be completed within a 24-month time frame.

d. Sample Size: Approximately 24 (once per month for 24 months) unless otherwise provided by contract.

e. Sites: Bayfront Park

f. Performance Criteria: Level of construction to terms of contract and permit requirements.

g. Corrective Action(s): Resolution with contractor such that the terms of the contract are met.

Parameter 2: Area (Pocket Beach)

a. Purpose: To document area of beach available for recreational use.

b. Method: High-resolution, near-vertical aerial imagery, RTK GPS survey data, or by measuring shoreline locations along established transects.

c. Timing and Frequency: Pre-construction, immediately following completion of construction (as-built) and one per year in Year 1, Year 2, and Year 3 following construction.

d. Sample Size: Five (5) total surveys

e. Sites: Bayfront Park pocket beach area

f. Performance Criteria: Area of pocket beach is not less than 10 percent of area as designed (Year 2).

g. Corrective Action(s): Additional sand fill may be required in the event of a large erosive disturbance event.

Parameter 3: Visitor use/access

a. Purpose: To estimate number of members of the public that are able to access and are using the site.

b. Method: Visual observation and/or use of automated counters

c. Timing and Frequency: 2 per year in years 1, 2 and 3 following completion of project.

d. Sample Size: Six (6) surveys total.

e. Sites: Bayfront Park.

f. Performance Criteria: Members of the public are able to use the amenities constructed/enhanced.

g. Corrective Action(s): Evaluate reason(s) the public may not be able to access the infrastructure and/or improvements and/or are not using them to the desired potential and correct those issues. A visitor satisfaction survey may be conducted to perform evaluation.

The schedule for project monitoring is shown in Table 2, separated by monitoring activity. Pre-execution monitoring will occur before project execution. As-built monitoring occurs when project has been fully executed as planned. Project/Performance monitoring will occur in the year following initial project execution.

Table 2: Monitoring Schedule

Monitoring Parameter	Objective(s)	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-3)
Infrastructure and habitat constructed and/or enhanced and completed as designed.	**1,2**		**X**	
Area (Pocket Beach)	**1, 2**	**X**	**X**	**X**
Visitor use/access	**1,2**			**X**

3. ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. Adaptive management should not be used for projects where learning is unlikely, where decisions are irreversible, or where no opportunity exists to revise or reevaluate decisions based on new information (Doremus et al. 2011).

The Bayfront Park Restoration and Improvement Project Phases IIa and IIb proposes to use standard engineering specifications and tried-and-tested construction methodology for constructing the improvements. The alternative's goal of enhancing public recreational access to and enjoyment of coastal areas along southwestern Mobile Bay has a high likelihood of success. Surveys indicate public demand for these amenities. No land acquisition is required, and the Mobile County Commission has a history of successfully implementing and managing similar recreational improvement projects as part of its natural resource management responsibilities at public parks and other county-owned properties. Because the project proposes to establish physical infrastructure, the decision to implement the project is mostly irreversible, as is the opportunity to revise or reevaluate the decision to construct and enhance the recreational features at Bayfront Park. For these reasons, significant adaptive management is not included in this MAM plan. However, if monitoring determines that the project is not meeting its goals

and objectives, then corrective actions should be used. Suggested corrective actions, if appropriate, are described above in Section 2.

4. EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed. As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did project activities undertaken produce unanticipated effects?
- Were there unanticipated events unrelated to the project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan will be made if needed.

5. DATA MANAGEMENT

5.1 Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 (DWH NRDA Trustees 2017). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field 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. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file 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 will be made and the original preserved.

5.2 Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks and would make any corrections to transcription errors as appropriate before data are used 8 for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate

monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

5.3 Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

5.4 Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

6. REPORTING

Annual MAM reports will be developed in accordance with Appendix E in the MAM Manual, describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface. A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

7. ROLES AND RESPONSIBILITIES

ADCNR is the Implementing Trustee for this project and will ensure the project is completed.

Mobile County will implement the project and be responsible for the timely submission of reports to the TIG via an Implementation Agreement with ADCNR. Mobile County will be responsible for monitoring progress towards each parameter and will provide regular reports to ADCNR documenting the progress and results of each parameter. Reports provided by Mobile County will be qualitative and quantitative and will be in a format which is easily interpreted and transcribed into DIVER at least annually and in accordance with Section 5, above.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

8. REFERENCES

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9. MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name

E-3: MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT
Gulf State Park Pier Renovation

1. PROJECT OVERVIEW

Located in Gulf Shores, Alabama, and owned by the State of Alabama, the Gulf State Park Pier opened to the public in July 2009 after the original pier was destroyed in 2004 by Hurricane Ivan. The pier is 20 feet wide, 1,540 feet long, and sits 20 feet above mean sea level. It stretches 22,670± square feet over the water and 2,448 feet of fishing space. The Gulf State Park Pier also includes a concession area and indoor retail shop.

This project would provide funding to renovate the Gulf State Park Pier. The original decking on the Gulf State Park Pier is now close to 10 years old and is showing considerable wear. This project would replace the entire pier deck with materials that have more longevity. The new decking would be removable in the event of a hurricane.

In addition to the replacement of the decking panels, this project also proposes to enhance the existing lighting at the pier and in the parking lot and replace the weathered pine handrails. The improved lighting would feature narrow spectrum amber LEDs combined with special shielding, which makes it a wildlife friendly lighting solution. Light poles at the pier would also be replaced.

The project would also replace the existing fish cleaning station. Many anglers use this station to clean their catch on a regular basis, and the carcasses of the cleaned fish are typically tossed into the Gulf and are quickly eaten by predator fish and/or sink to the bottom. The "chumming" of this area attracts sharks and pelicans that have become a nuisance. This project would replace the fish cleaning station with one that includes a Hydro Shredder-Grinder suitable for handling pier-caught fish carcasses. The discharge would be disposed through a nearby existing sewer line. Equipment would include a marine-grade stainless steel cleaning table with water hoses and a powered grinder with safety enclosures and lockout doors to prevent regular access to unit. Water, power, and sanitary sewer utilities would be required and are available nearby for connection. The station would comply with the Americans with Disability Act (ADA) and include two ADA-compliant cutting table surfaces.

1.1 Restoration Type Goals and Project Restoration Objectives

- **Programmatic Goal:** Provide and enhance recreational opportunities.
- **Restoration Type:** Provide and enhance recreational opportunities.
- **Restoration Type Goal:** Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.
- **Restoration Approaches:** Enhance Recreational Experience. Enhance public access to natural resources for recreational use.
- **Restoration Technique(s):** Enhance or construct park infrastructure.

Objective 1: Enhance public access through infrastructure development.

Objective 2. Manage site for recreational use and natural resources.

1.2 Conceptual Setting and Anticipated Outcomes

A conceptual model 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 outcome.

Table 1: Conceptual Model

Activity	Output	Short-term Outcome	Long-term Outcome
Complete construction of infrastructure and amenities.	Infrastructure is completed and the amenities are utilized.	New infrastructure and amenities function as designed.	• The public is able to use the amenities as designed. • Visitation to the fishing pier increases.

1.3 Sources of Uncertainty

Drivers are outside forces, natural or anthropogenic, that have the potential to influence the outcomes of a restoration project (DWH NRDA Trustees 2017: Section E.6.3). Drivers tend to be large-scale, long-term forces that are not easily controlled at the scale of a single restoration project (Harwell et al. 2016).

When evaluating the proposed project, the following outside drivers and stressors were considered:

- Human attachment to or interest in recreational activities
- Frequency and intensity of hurricanes
- Public interest or need

This list should not be considered exhaustive; additional drivers may be identified as the project is implemented and/or monitored. These drivers may affect the achievement of the restoration goals and objectives of the project. For example, if the intensity and frequency of hurricanes increase in the region, the pier may need additional maintenance or reconstruction due to storm impacts. If any drivers are negatively impacting the project, adaptive management may be necessary to ensure the project's goals and objectives are being achieved. The adaptive management strategy for the project is outlined below.

Project uncertainties, or information gaps, have the potential to affect adaptive management decisions for restoration projects, such as how to improve the likelihood of achieving the goals and objectives of the project, or identifying corrective actions if the project is not performing as intended.

When evaluating this recreational use project, the following uncertainties were considered:

- Increased use of the area
- Ability to attract public use of the area
- Potential impact on local community (e.g., noise related to having too many visitors, trash).

This list should not be considered exhaustive; additional uncertainties could be identified as the project is implemented and/or monitored. Based on ADCNR's data on entry fees collected at the pier, at least 100,000 persons visit the pier each year.[1] Actual visitation is likely substantially greater since ADCNR's

[1] This is estimated assuming reported gate receipts of $919,121 in FY2018 divided by the single day charge for adults fishing ($9). This represents a lower bound on visitation since children enter free and those not fishing can enter for $3. Also,

estimate is based on entry fees for adults that are fishing and does not account for children age 11 and under who enter the pier free when accompanied by an adult or for non-fishing adults who enter at a lower cost. Given current experience at the pier, it is expected that there would be sufficient demand for pier-fishing and pier-based wildlife viewing at the site, and that it would operate at full capacity during at least part of the year. This project is located within the footprint of Gulf State Park, which is already a high-visitation area, thus additional impacts on the local community are not expected. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this draft RP III/EA.

2. PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives. The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter 1: Infrastructure constructed and/or enhanced and completed as designed.

a. Purpose: On-site monitoring will be conducted during construction to ensure improvements are constructed according to plans and to ensure that construction activities comply with the full set of environmental permit conditions.

b. Method: Project implementor to review contractor reports, conduct on-site inspections, and compare to construction drawings.

c. Timing and Frequency: Approximately monthly and at end of project unless otherwise provided by contract. The construction elements of the project are expected to be completed within a 6-month time frame.

d. Sample Size: Approximately 6 (once per month for 6 months) unless otherwise provided by contract.

e. Sites: Gulf State Park Pier- pier, fish cleaning station, parking lot.

f. Performance Criteria: Level of construction to terms of contract and permit requirements.

g. Corrective Action(s): Resolution with contractor such that the terms of the contract are met.

Parameter 2: Visitor use/access

individuals can purchase lower cost weekly, monthly, semiannual or annual passes for the pier, all at reduced cost relative to the daily pass.

a. Purpose: To estimate number of members of the public that are able to access and are using the site.

b. Method: Visual observation and/or use of automated counters

c. Timing and Frequency: Four days during months of May-October for 3 years following construction completion

d. Sample Size: 12 surveys total

e. Sites: Gulf State Park Pier

f. Performance Criteria: Members of the Public are able to use the amenities constructed/enhanced.

g. Corrective Action(s): Evaluate reason(s) the public may not be able to access the infrastructure and/or improvements and/or are not using them to the desired potential and correct those issues. A visitor satisfaction survey may be conducted to perform evaluation.

The schedule for project monitoring is shown in Table 2, separated by monitoring activity. Pre-execution monitoring will occur before project execution. As-built monitoring occurs when project has been fully executed as planned. Project/Performance monitoring will occur in the year following initial project execution.

Table 2: Monitoring Schedule

Monitoring Parameter	Objective(s)	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-3)
Infrastructure constructed and/or enhanced and completed as designed.	**1,2**		**X**	
Visitor use/access	**1,2**			**X**

3. ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. Adaptive management should not be used for projects where

learning is unlikely, where decisions are irreversible, or where no opportunity exists to revise or reevaluate decisions based on new information (Doremus et al. 2011).

The project proposes to use standard engineering specifications and tried-and-tested construction methodology for constructing the improvements. The alternative's goal of enhancing the public's recreational fishing and wildlife viewing access and enjoyment at Gulf State Park has a high likelihood of success. There is proven demand for the facility. No land acquisition is required, and ADNCR already successfully operates the GSP pier as part of its day-to-day natural resource management responsibilities. Also, managing a construction effort of this type is well within the scope of ADCNR's past experience. For these reasons, significant adaptive management is not included in this MAM plan. However, if monitoring determines that the project is not meeting its goals and objectives, then corrective actions should be used. Suggested corrective actions, if appropriate, are described above in Section 2.

4. EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed. As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project objectives achieved? If not, is there a reason why they were not met?
- Did project activities undertaken produce unanticipated effects?
- Were there unanticipated events unrelated to the project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan will be made if needed.

5. DATA MANAGEMENT

5.1 Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 (DWH NRDA Trustees 2017). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field 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. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can

reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file 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 will be made and the original preserved.

5.2 Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks and would make any corrections to transcription errors as appropriate before data are used 8 for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

5.3 Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

5.4 Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

6. REPORTING

Annual MAM reports will be developed in accordance with Appendix E in the MAM Manual describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface. A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

7. ROLES AND RESPONSIBILITIES

ADCNR is the Implementing Trustee agency for this project and will ensure that the project is completed and implemented. ADCNR will be responsible for monitoring progress towards each parameter and will provide regular reports documenting the progress and results of each parameter. Reports provided by ADCNR will be qualitative and quantitative and will be in a format which is easily interpreted and transcribed into DIVER at least annually and in accordance with Section 5, above.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

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9. MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name

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E-4: MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT
Perdido Beach Public Access Coastal Protection

1. PROJECT OVERVIEW

This proposed project would fund permitting, design, and construction of shoreline protection breakwaters at two areas of public access to the water in Perdido Beach, Alabama (Mobile Avenue and Escambia Avenue). Coastal storms and surges and residential hardening of the seawall adjacent to the public access points have resulted in the loss of a large amount of sand at the public access, leaving little to no beaches for the public to enjoy. Seawalls are located on either side of the beach access. Hardened seawalls tend to cause scouring to the adjacent properties, and the two public access properties have been eroding over time (see Figure 2-6).

While the portion of the beach above the mean high-water mark is privately owned, the entire beach area is included in a public easement, and the public has been accessing this site for beach use for nearly 20 years. The public has a right to use and access any of the privately owned areas within the easement. This project would install two shoreline protection projects. Once breakwaters are in place, sand would be hauled in to stabilize and renourish beach areas, and native vegetative planting would be added to further stabilize the shoreline. The State of Alabama would own the renourished beach area, and appropriate documentation confirming this ownership and easement use would be obtained prior to beginning work on this project.

This area of Perdido Beach is one of the few areas that does not contain a seawall, and the sand would allow natural drainage and percolation. Vegetation would be planted in strategic areas to provide a buffer and to prevent scouring. This wetland would consist of vegetation that would also act as a nursery for fish and provide educational opportunities for the public. In addition to recreational use benefits, the project is expected to provide a number of additional benefits, including shoreline protection, coastal and terrestrial habitat restoration, and benefits to aquatic nursery habitat. ADCNR would serve as the implementing Trustee for this project.

Proposed Infrastructure/Improvements. The Mobile Avenue public access beach area would consist of 309 linear feet of riprap. Thirteen 20-foot sections with 5-foot gaps and a small breakwater in front of each gap would be installed with 3-foot spacing and native wetland vegetation would be planted.

The second project site would be Escambia Avenue. The Escambia Avenue public access beach area would consist of 302 linear feet of riprap that is staggered. Native wetland vegetation would be planted directly in front of the breakwater. An estimated 1,005 cubic yards of sand would be trucked to renourish the beach. Vegetation plantings would be strategically located to help stabilize the shoreline.

1.1 Restoration Type Goals and Project Restoration Objectives

- **Programmatic Goal:** Provide and enhance recreational opportunities.
- **Restoration Type:** Provide and enhance recreational opportunities.
- **Restoration Type Goal:** Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.

- **Restoration Approaches:** Enhance Recreational Experience. Enhance public access to natural resources for recreational use.
- **Restoration Technique(s):** Enhance and construct infrastructure.

Objective 1: Enhance public access and use through beach nourishment and related activities.

Objective 2: Stabilize shoreline and protect beach areas through the construction of breakwaters.

1.2 Conceptual Setting and Anticipated Outcomes

A conceptual model 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 outcome.

Table 1: Conceptual Model

Activity	Output	Short-term Outcome	Long-term Outcome
Complete construction of infrastructure improvements and amenities (beach nourishment and breakwaters).	Infrastructure is completed and the amenities are utilized.	New infrastructure and amenities function as designed.	• The public is able to use the amenities as designed. • Visitation to the beach areas increases.

1.3 Sources of Uncertainty

Drivers are outside forces, natural or anthropogenic, that have the potential to influence the outcomes of a restoration project (DWH NRDA Trustees 2017: Section E.6.3). Drivers tend to be large-scale, long-term forces that are not easily controlled at the scale of a single restoration project (Harwell et al. 2016).

When evaluating the proposed project, the following outside drivers and stressors were considered:

- Development and changes in land use
- Human attachment to or interest in recreational activities
- Frequency and intensity of hurricanes
- Sea level rise
- Public interest or need

This list should not be considered exhaustive; additional drivers may be identified as the project is implemented and/or monitored. These drivers may affect the achievement of the restoration goals and objectives of the project. For example, if the intensity and frequency of hurricanes increase in the region, or if there is an increase in the rate of sea level rise, the beach may need to be renourished or the breakwaters may not be as effective at attenuating wave energy. If any drivers or stressors are negatively impacting the project, adaptive management may be necessary to ensure the project's goals and objectives are being achieved. The adaptive management strategy for the project is outlined below.

Project uncertainties, or information gaps, have the potential to affect adaptive management decisions for restoration projects, such as how to improve the likelihood of achieving the goals and objectives of the project, or identifying corrective actions if the project is not performing as intended.

When evaluating this recreational use project, the following uncertainties were considered:

- Increased use of the area
- Ability to attract public use of the area
- Potential need for ecological restoration (e.g., as a result of increased use of the area)
- Potential impact on local community (e.g., noise related to having too many visitors, trash).

This list should not be considered exhaustive; additional uncertainties could be identified as the project is implemented and/or monitored. During the planning phase of the project, it was assumed that the improvements to beach access would attract increased public use of the area. The Town of Perdido Beach will maintain the property and enforce local ordinances. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this draft RP III/EA.

2. PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives. The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter 1: Visitor use/access

a. Purpose: To estimate number of members of the public that are able to access and are using the site.
b. Method: Visual observation and/or use of automated counters
c. Timing and Frequency: Four days during months of May-October for 3 years following construction completion
d. Sample Size: Twelve (12) surveys total
e. Sites: Perdido Beach public access
f. Performance Criteria: Members of the public are able to use the amenities constructed/enhanced.
g. Corrective Action(s): Evaluate reason(s) the public may not be able to access the infrastructure and/or improvements and/or are not using them to the desired potential and correct those issues. A visitor satisfaction survey may be conducted to perform evaluation.

Parameter 2: Infrastructure and habitat constructed and/or enhanced and completed as designed.

a. Purpose: On-site monitoring will be conducted during construction to ensure improvements constructed according to plans and to ensure that construction activities comply with the full set of environmental permit conditions.

b. Method: Project Implementor to review contractor reports, conduct on-site inspections as needed, and compare to construction drawings.

c. Timing and Frequency: Approximately monthly and at end of project unless otherwise provided by contract. The project is expected to be completed within an 18-month timeframe

d. Sample Size: Approximately 18 (once per month for 18 months) unless otherwise provided by contract

e. Sites: Perdido Beach public access

f. Performance Criteria:

g. Hydrographic modeling supports design concept.

h. Project amenities are constructed as designed and specified in the contract.

i. Corrective Action(s):

j. In the event that hydrographic models do not support the existing conceptual design for the project, the design will be amended, or the project will be canceled if necessary modifications exceed the budget available for the project (and other funding sources cannot be identified) and if the new design does not support the TIG's goals.

k. Resolution with contractor such that the terms of the contract are met.

Parameter 3: Shoreline Position

a. Purpose: To allow for documentation of shoreline change over time, including in response to particular disturbance events.

b. Method: High-resolution, near-vertical aerial imagery, RTK GPS survey data, or by measuring shoreline locations along established transects.

c. Timing and Frequency: Pre-construction, immediately following completion of construction (as-built) and once in year 2 following construction

d. Sample Size: 3 total surveys

e. Sites: Perdido Beach public access

f. Performance Criteria: NA

g. Corrective Action(s): Additional maintenance may be required in the event of a large erosive disturbance event.

Parameter 4: Vegetation Survival (%)

a. Purpose: Used to evaluate whether additional plantings are needed to promote and establish appropriate vegetation communities.

b. Method: Count the total number of planted plants, and the number of live or dead plantings within established plots. Field sampling could include quadrats, transects, or point surveys. Data collected will be used to calculate vegetation survival.

c. Timing and Frequency: Twice during the first growing season after planting (30 days and 90 days post-planting) and at one year after planting. 3 events totals.

d. Sample Size: 4 plots distributed over planting area

e. Sites: Perdido Beach public access planted areas

f. Performance Criteria: 75 percent survival after year 1

g. Corrective Action(s): Plant additional vegetation if needed.

The schedule for project monitoring is shown in Table 2, separated by monitoring activity. Pre-execution monitoring will occur before project execution. As-built monitoring occurs when project has been fully executed as planned. Project/Performance monitoring will occur in the year following initial project execution.

Table 2: Monitoring Schedule

Monitoring Parameter	Objective(s)	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-3)
Visitor use/access	**1,2**	**X**		**X**
Infrastructure and habitat constructed and/or enhanced and completed as designed.	**1,2**		**X**	
Shoreline Position	**1,2**	**X**	**X**	**X**
Vegetation Survival	**1**		**X**	**X**

3. ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al., 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. Adaptive management should not be used for projects where learning is unlikely, where decisions are irreversible, or where no opportunity exists to revise or reevaluate decisions based on new information (Doremus et al. 2011).

This is a relatively small project to implement and well within the historical construction management experience of the Town of Perdido Beach. Once construction is complete, demand for recreation at the two beaches is expected to continue at levels similar to those seen in the past. The project proposes to use standard engineering specifications and tried-and-tested construction methodology for constructing the improvements. The alternative's goal of maintaining public recreational access to and enjoyment of coastal areas along Perdido Bay has a reasonable likelihood of success, although final implementation of the project would be contingent on a final hydrographic study confirming the effectiveness of the proposed design. In the event that hydrographic models do not support the existing conceptual design for the project, the design will be amended, or the project will be canceled if necessary modifications exceed the budget available for the project (and other funding sources cannot be identified.) If monitoring determines that the project is not meeting its goals and objectives, then corrective actions should be used. Suggested corrective actions, if appropriate, are described above in Section 2.

4. EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed. As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project objectives achieved? If not, is there a reason why they were not met?
- Did project activities undertaken produce unanticipated effects?
- Were there unanticipated events unrelated to the project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan will be made if needed.

5. DATA MANAGEMENT

5.1 Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 (DWH NRDA Trustees 2017). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field 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. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was

created and will include a ReadMe file 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 will be made and the original preserved.

5.2 Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks and would make any corrections to transcription errors as appropriate before data are used 8 for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

5.3 Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

5.4 Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

6. REPORTING

Annual MAM reports will be developed in accordance with Appendix E in the MAM Manual, describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface. A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

7. ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee Agency for this project and will ensure the project is completed.

The Town of Perdido Beach will implement the project and be responsible for the timely submission of reports to the TIG via an Implementation Agreement with ADCNR. The Town of Perdido Beach will be responsible for monitoring progress towards each parameter and will provide regular reports to ADCNR documenting the progress and results of each parameter. Reports provided by The Town of Perdido Beach will be qualitative and quantitative and will be in a format which is easily interpreted and transcribed into DIVER at least annually and in accordance with Section 5, above.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

8. REFERENCES

Doremus, H., W.L. Andreen, A. Camacho, D.A. Faber, R.L. Glicksam, D.D. Goble, B.C. Karkkainen, D. Rohlf, A.D. Tarlock, S.B. Zellmer, S. Campbell-Jones, and Y. Huang. 2011. Making Good Use of Adaptive Management. Center for Progressive Reform White Paper No. 1104.

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Harwell, M.A., J.H. Gentile, L.D. McKinney, J.W. Tunnell Jr., W.C. Dennison, and R.H. Kelsey. 2016. A New Framework for the Gulf of Mexico EcoHealth Metrics. Available at: http://www.harteresearchinstitute.org/sites/default/files/resources/Framework%20for%20the%20Gulf%20EcoHea lth%20Metric.pdf. Accessed January 29, 2018.

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Pastorok, R.A., MacDonald, A., Sampson, J.R., Wilber, P., Yozzo, D.J., & Titre, J.P. 1997. An Ecological Decision Framework for Environmental Restoration Projects. *Ecological Engineering* 9:89–107.

Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A Programmatic Application of Adaptive Management. *Ecological Engineering* 26: 27–39.

Williams, B.K. 2011. Adaptive Management of Natural Resources - Framework and Issues. *Journal of Environmental Management* 92:1346–1353.

9. MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name

E-5: MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT
Bon Secour National Wildlife Refuge Recreation Enhancement—Mobile Street Boardwalk

1. PROJECT OVERVIEW

This project would replace or repair public boardwalks and trailhead parking lots at the Bon Secour National Wildlife Refuge (BSNWR) and enhance directional and informational signage to facilitate public use, consistent with the BSNWR's Comprehensive Conservation Plan and visitor use objectives. The Mobile Street boardwalk and parking lot, a much-loved local beach access point, typically hosts 57,000 annual visitors. This heavy use and several hurricanes over the years have degraded this infrastructure. USFWS has completed numerous repairs to keep the boardwalk open. However, with declining BSNWR staff and the dunes starting to reclaim that area, it has become more difficult to maintain a safe, accessible boardwalk to the beach. USFWS has been able to maintain the site to allow the boardwalk to remain open; however, continued degradation could lead to closure.

The current boardwalk would be replaced with a recycled composite board material that has a longer life span than wood in harsh coastal environments and would be easier to maintain. Access and erosion issues in the nearby public parking lot would also be addressed. The replacement boardwalk would be 6 feet wide and approximately 500 feet long. A larger platform toward the north end would facilitate ADA-compliant access. The boardwalk's height would be variable, most likely between 0 to 10 feet above the ground surface, would be designed to meet ADA criteria, and would allow for clearance of the existing dune system. Final heights would be guided by engineering surveys. Two benches, serving as resting places for visitors and persons with limited mobility, would be installed along the boardwalk to meet ADA compliance requirements. A kiosk and one way-finding sign would be installed in the parking lot, and other wayfinding signs would be installed along Mobile Street and Highway 180 to facilitate visitor access. The parking lot is approximately 10,004 square feet with room for approximately 30 parked cars. The parking lot currently retains water after rain events, has potholes, and is degraded by erosion, limiting access and affecting adjacent habitat. To mitigate this issue, proper drainage would be installed, the surface would be leveled, and gravel would be added. It is anticipated that this project would continue to support visitation at historical levels, while also attracting an additional 7,000 annual visitors. USDOI would serve as the implementing Trustee for this project.

Construction would include deconstruction/demolition of existing boardwalks/parking lots and construction of a new boardwalk and parking lots with a construction duration of approximately 1 to 3 months. Construction on the Mobile Street boardwalk and parking lot is expected take place from October through April.

1.1 Restoration Type Goals and Project Restoration Objectives

- **Programmatic Goal:** Provide and enhance recreational opportunities.
- **Restoration Type:** Provide and enhance recreational opportunities
- **Restoration Type Goal:** Increase recreational opportunities such as fishing, beach-going, camping, and boating with a combination of ecological restoration and creation of infrastructure, access, and use opportunities.

- **Restoration Approaches:** Enhance Recreational Experience. Enhance public access to natural resources for recreational use.
- **Restoration Technique(s):** Enhance or construct park infrastructure.

Objective 1: Enhance public access through infrastructure development.

Objective 2. Manage site for recreational use and natural resources.

1.2 Conceptual Setting and Anticipated Outcomes

A conceptual model 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 outcome.

Activity	Output	Short-term Outcome	Long-term Outcome
Complete construction of infrastructure and amenities.	Infrastructure is completed and the amenities are utilized.	New infrastructure and amenities function as designed.	• The public is able to use the amenities as designed. • Visitation to the Bon Secour NWR increases.

1.3 Sources of Uncertainty

Drivers are outside forces, natural or anthropogenic, that have the potential to influence the outcomes of a restoration project (DWH NRDA Trustees 2017: Section E.6.3). Drivers tend to be large-scale, long-term forces that are not easily controlled at the scale of a single restoration project (Harwell et al. 2016).

When evaluating the proposed project, the following outside drivers and stressors were considered:

- Development and changes in land use
- Human attachment to or interest in recreational activities
- Frequency and intensity of hurricanes
- Public interest or need

This list should not be considered exhaustive; additional drivers may be identified as the project is implemented and/or monitored. These drivers may affect the achievement of the restoration goals and objectives of the project. If any drivers are negatively impacting the project, adaptive management may be necessary to ensure the project's goals and objectives are being achieved. The adaptive management strategy for the project is outlined below.

Project uncertainties, or information gaps, have the potential to affect adaptive management decisions for restoration projects, such as how to improve the likelihood of achieving the goals and objectives of the project, or identifying corrective actions if the project is not performing as intended.

When evaluating this recreational use project, the following uncertainties were considered:

- Increased use of the area
- Ability to attract public use of the area
- Potential need for ecological restoration (e.g., as a result of increased use of the area)

- Potential impact on local community (e.g., noise related to having too many visitors, trash).

This list should not be considered exhaustive; additional uncertainties could be identified as the project is implemented and/or monitored. BSNWR is a major provider of outdoor recreational experiences on the Fort Morgan Peninsula. The refuge currently attracts approximately 135,000 visitors annually and, according to refuge staff the proposed recreational projects in the plan, if fully implemented, are anticipated to increase this by approximately 13,000 visitors (almost 10 percent). With respect to total number of visitors served, keeping the Mobile Street Boardwalk open and operating would have the greatest impact. In the short run, closure of this boardwalk would shut off beach access to approximately 57,000 visitors annually. Over time, a rebuilt boardwalk is expected to serve increasing numbers of visitors, with projected growth eventually adding an additional 7,000 user-days per year. Implementation of the alternative is not expected to cause any net collateral damage to the environment. The reasons for this are discussed more fully in Chapter 4 of this draft RP III/EA.

2. PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives. The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter 1: Infrastructure constructed and/or enhanced and completed as designed.

a. Purpose: On-site monitoring will be conducted during construction to ensure improvements are constructed according to plans and to ensure that construction activities comply with the full set of environmental permit conditions.

b. Method: Project implementor to review contractor reports, conduct on-site inspections as needed, and compare to construction drawings.

c. Timing and Frequency: Approximately monthly and at end of project unless otherwise provided by contract. The project is expected to be completed within a 3-month time frame.

d. Sample Size: Approximately 3 (once per month for 1-3 months) unless otherwise provided by contract

e. Sites: Construction area at Bon Secour NWR

f. Performance Criteria: Level of construction to terms of contract and permit requirements.

g. Corrective Action(s): Resolution with contractor such that the terms of the contract are met.

Parameter 2: Visitor use/access

a. Purpose: To estimate number of members of the public that are able to access and are using the site.

b. Method: Visual observation and/or use of automated counters

c. Timing and Frequency: Four days during months of May-October for 3 years following construction completion

d. Sample Size: 12 surveys total

e. Sites: Improved areas at Bon Secour NWR

f. Performance Criteria: Members of the Public are able to use the amenities constructed/enhanced.

g. Corrective Action(s): Evaluate reason(s) the public may not be able to access the infrastructure and/or improvements and/or are not using them to the desired potential and correct those issues. A visitor satisfaction survey may be conducted to perform evaluation.

The schedule for project monitoring is shown in Table 2, separated by monitoring activity. Pre-execution monitoring will occur before project execution. As-built monitoring occurs when project has been fully executed as planned. Project/Performance monitoring will occur in the year following initial project execution.

Table 2: Monitoring Schedule

Monitoring Parameter	Objective(s)	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-3)
Infrastructure and habitat constructed and/or enhanced and completed as designed.	**1**		**X**	
Visitor use/access	**1,2**	**X**		**X**

3. ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project

success or the need for corrective action. Adaptive management should not be used for projects where learning is unlikely, where decisions are irreversible, or where no opportunity exists to revise or reevaluate decisions based on new information (Doremus et al. 2011).

The project proposes to use standard engineering specifications and tried-and-tested construction methodology for constructing the improvements. The alternative's goals of maintaining and increasing public recreational access to and enjoyment of the BSNWR have a high likelihood of success. USFWS has demonstrated experience implementing a project of this type. The agency already successfully manages the BSNWR's recreational infrastructure that has reached the end of its useful life and needs to be reconstructed. Further, use data collected by the agency indicate sufficient public demand for the proposed components of this alternative.

For these reasons, significant adaptive management is not included in this MAM plan. However, if monitoring determines that the project is not meeting its goals and objectives, then corrective actions should be used. Suggested corrective actions, if appropriate, are described above in Section 2.

4. EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed. As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project objectives achieved? If not, is there a reason why they were not met?
- Did project activities undertaken produce unanticipated effects?
- Were there unanticipated events unrelated to the project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan will be made if needed.

5. DATA MANAGEMENT

5.1 Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 (DWH NRDA Trustees 2017). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field 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. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other

information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file 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 will be made and the original preserved.

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After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks and would make any corrections to transcription errors as appropriate before data are used 8 for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

5.3 Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

5.4 Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

6. REPORTING

Annual MAM reports in accordance with Appendix E in the MAM Manual describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface. A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

7. ROLES AND RESPONSIBILITIES

DOI is the Implementing Trustee agency for this project and will ensure that the project is completed and reports are provided to the TIG in a timely manner.

Bon Secour NWR will implement the project and be responsible for the timely submission of reports to the TIG via an Implementation Agreement with DOI. Bon Secour NWR will be responsible for monitoring progress towards each parameter and will provide regular reports to the ALTIG documenting the progress and results of each parameter. Reports provided by Bon Secour NWR will be qualitative and quantitative and will be in a format which is easily interpreted and transcribed into DIVER at least annually and in accordance with Section 5, above.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

8. REFERENCES

Doremus, H., W.L. Andreen, A. Camacho, D.A. Faber, R.L. Glicksam, D.D. Goble, B.C. Karkkainen, D. Rohlf, A.D. Tarlock, S.B. Zellmer, S. Campbell-Jones, and Y. Huang. 2011. Making Good Use of Adaptive Management. Center for Progressive Reform White Paper No. 1104.

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Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering* 26:27–39.

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9. MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name

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E-6: MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT
Stewardship of Coastal Alabama Beach Nesting Bird Habitat

1. PROJECT OVERVIEW

The Gulf Coast region supports a diversity of coastal bird species throughout the year, as nesting grounds during the summer, as a stopover for migrating species in the spring and fall, and as winter foraging and sheltering habitat for numerous species that breed elsewhere.

This project would expand on existing work in coastal Alabama by reducing human disturbance to and predation of nests and chicks of coastal nesting bird species injured by the DWH oil spill, thereby potentially increasing productivity of those species. These techniques have been identified by the DWH Trustees in the Strategic Framework for Bird Restoration Activities (DWH NRDA Trustees, 2017a). This proposed three-year project would complement the work of similar initiatives in the Gulf of Mexico in Florida, Mississippi, Louisiana, and Texas. ADCNR would be the implementing Trustee; USDOI would be a collaborating agency.

The program would consist of five components that would work together to reduce stressors that affect coastal bird populations and provide information to support future restoration decision-making. Specific activities and target locations may vary from year to year based on a number of factors including, but not limited to: where nesting occurs, where evidence of stressors is detected, what management activities are most successful at each area, and where project implementers are able to gain access (some nesting areas may be located on private property and will require authorization from landowners to access). Proposed initial target project areas and restoration actions are listed in Table 3.

a. **Conduct stewardship activities to reduce human disturbances that contribute to nest failure.** Human disturbance is of particular concern for beach nesting birds in coastal Alabama because of the popularity of Alabama's beaches for recreational activities. This disturbance often leads to seasonal nest or colony abandonment in local areas, resulting in egg loss and chick mortality. Reducing anthropogenic disturbance at important nesting areas can support success (Burger et al., 2004; DWH Trustees 2016a; Larson et al., 2016; McGowan and Simons, 2006; Molina and Erwin, 2006; Pruner et al., 2011). A primary element of the proposed program would involve reducing human disturbance in target nesting areas to improve local productivity. Species that would benefit from this project include the least tern (*Sternula antillarum*), black skimmer (*Rynchops niger*), snowy plover (*Charadrius nivosus*), and Wilson's plover (*Charadrius wilsonia*). Project implementers would install symbolic (temporary post and rope) and/or exclusionary fencing around nesting areas prior to the start of the nesting season to reduce human ingress and disturbance. While on site, implementers may also work to educate and guide beachgoers away from sensitive nesting areas. Implementers could also engage the public by providing opportunities to observe birds from a safe distance using viewing scopes into nesting areas for the public to observe adults incubating eggs and/or feeding small, flightless chicks from a safe distance. These activities would serve to encourage protective behavior by the public, further reducing disturbance.

b. **Conduct targeted, coordinated predator management activities.** Site-specific predator management strategies can help increase bird productivity where predators are among the primary causes of nest or fledgling mortality (Greer et al., 1988; Saalfield et al., 2011). The City of Orange Beach, for example, is currently implementing a predator management strategy on islands in Perdido Bay focused on the management of red fox and coyote, and BSNWR is planning coyote

removal from targeted units at strategic times to facilitate beach nesting bird production. This project would coordinate with these activities to help refine beach nesting bird predator management activities. Funding would support continued predator management efforts at BSNWR and in the City of Orange Beach and begin predator management activities on Dauphin Island and/or other sites where needed.

c. **Conduct monitoring in support of adaptive management at project sites to determine nesting and fledging success.** Monitoring critical nesting sites, assessing nest success, and determining breeding densities provides insight into the status of Alabama breeding populations for the above-referenced species, all of which are listed as Alabama Species of Conservation Concern (ADCNR 2015). Nesting activity and evidence of predator activity would be monitored following Pruner et al. (2011) or another appropriate method that facilitates consistent data collection across similar projects in the Gulf region. In addition to bird numbers and breeding productivity, monitoring would also quantify and assess the number of acres treated with fencing, education, predator reduction; quantify and assess habitat quality, degree of predator activity, extent of human disturbance, and number of people reached with outreach and education activities. These data would help inform Trustees' understanding of coastal ecosystem health and the extent of human-induced threats. Project implementers would coordinate routinely to discuss adaptive management of posted areas (e.g., shifting or expanding a posted area).

d. **Deploy decoys.** Species-specific decoys would be deployed to attract target bird species to suitable nesting areas (e.g., lower risk of human disturbance or predation and that contain natural cover and forage access for adults and chicks). In some cases, species are nesting in areas of high human traffic or predation, which increases the likelihood of nest failure. Deploying decoys to areas that are not currently used for nesting, but are deemed suitable habitat, would potentially encourage target species to use habitat that experiences reduced stressors associated with nest or fledgling mortality. Decisions regarding specific deployment locations would be made in coordination with ADCNR and USDOI experts prior to implementation.

e. **Conduct habitat and nesting area enhancements.** The City of Orange Beach actively manages a number of islands in the Perdido area for bird species, including least tern, black skimmer, and great blue heron. The project would increase the size of a current least tern nesting area by removing vegetation and installing/distributing shell hash. Vegetation plantings are also proposed and would include a variety of native trees and shrubs and coastal dune grasses on Robinson and Walker Islands. The project would also repair/replace signage and perch posts as needed in Submerged Aquatic Vegetation (SAV) beds to deter boat traffic in areas that serve as foraging habitat for birds.

1.1 Restoration Type Goals and Project Restoration Objectives

- **Programmatic Goal:** Replenish and protect living coastal and marine resources.
- **Restoration Type:** Birds
- **Restoration Type Goal:** Restore lost birds by facilitating additional production and/or reduced mortality of injured bird species.
- **Restoration Approaches:** Establish or re-establish breeding colonies. Protect and conserve marine, coastal, estuarine and riparian habitats.
- **Restoration Technique(s):** Use decoys to attract breeding adults to potential breeding sites. Develop and implement management actions in conservation areas and/or restoration projects. Conduct stewardship activities to address anthropogenic stress.

Objective 1: Reduce anthropogenic disturbances to colonial beach nesting birds and solitary beach nesting birds.

Objective 2. Reduce threats to birds from mammalian predators.

Objective 3. Conduct habitat enhancements in nesting areas.

Objective 4. Monitor nesting and fledging success at select sites.

1.2 Conceptual Setting and Anticipated Outcomes

A conceptual model 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 outcome. The purpose of the conceptual setting within a Monitoring and Adaptive Management (MAM) Plan is to identify, document and communicate interactions and linkages among system components at the project site and to understand how these system components may be affected by associated restoration actions.

Table 1: Conceptual Model

Activity	Output	Short-term outcome	Long-term outcomes
Install symbolic fencing and conduct outreach at select nesting areas	Deter human disturbance and educate visitors	Reduce anthropogenic disturbance	• Enhanced bird reproductive success • Enhanced habitat quality and availability for target bird species • Enhanced bird forage base • Enhanced bird diversity • Improved resiliency and sustainability of coastal habitat
Conduct predator management activities at select nesting sites	Remove predators	Reduce stress/mortality to nests/young/adults	
Monitor nesting and fledging success at select sites.	New information to understand potential benefits of restoration actions and inform future restoration decision-making	Increase knowledge of the most effective restoration techniques for beach nesting birds	
Apply alternative site attraction	Deploy decoys deployed to selected suitable habitats	Attract birds to nest in more suitable habitats	
Prepare sites with suitable vegetation/shell hash, install signage, and deploy decoys.	Habitat enhancements are completed	Enhanced habitat quality/quantity	

1.3 Sources of Uncertainty

Drivers are outside forces, natural or anthropogenic, that have the potential to influence the outcomes of a restoration project (DWH Trustees 2017: Section E.6.3). Drivers tend to be large-scale, long-term forces that are not easily controlled at the scale of a single restoration project (Harwell et al. 2016).

When evaluating the proposed project, the following outside drivers and stressors were considered:

- Sea level rise
- Catastrophic weather
- Human disturbance
- Predators

This list should not be considered exhaustive; additional drivers may be identified as the project is implemented and/or monitored. These drivers may affect the achievement of the restoration goals and objectives of the project. For example, if the intensity and frequency of hurricanes increase in the region, or if there is an increase in the rate of sea level rise, nesting areas could be impacted. The target species for this project are highly vulnerable to disturbance because they commonly forage and nest in areas that are also highly utilized by humans, and are located in areas that are susceptible to weather disturbance events such as hurricanes (Enwright et al., 2017). If any drivers and/or stressors are negatively impacting the project, adaptive management may be necessary to ensure the project's goals and objectives are being achieved. The adaptive management strategy for the project is outlined below.

Uncertainties or information gaps have the potential to affect adaptive management decisions for individual or multiple restoration projects. These decisions may include how to improve the likelihood of achieving favorable project outcomes or selecting corrective actions in the event a project is not performing as intended. The following are example uncertainties that may be applicable to this project. This list should not be considered exhaustive; additional uncertainties may be identified as many uncertainties exist around bird responses to various restoration techniques (NAS 2017).

- Land use changes
- Whether people respond positively to stewardship efforts to reduce disturbance
- Frequency of high intensity overwash or nest site flooding
- Short-and long-term fate of natural and/or placed material
- Natural variability in ecological and physical processes, such as wave-driven transport or vegetation growth, and in the associated habitat responses
- Effect of predator management on nesting success

2. PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable

performance criteria and potential corrective actions for project parameters associated with project objectives. The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

The monitoring parameters below are directly related to assessing the performance of the proposed project activities, which include predator management, active stewardship, decoy deployment and habitat enhancements.

The ALTIG is taking an adaptive approach to this project in order to maximize benefits over time. The ALTIG has preliminarily identified a number of potential target locations based on previous nesting data compiled under the National Fish and Wildlife Foundation Gulf Environmental Benefit Fund- funded Alabama Coastal Bird Stewardship Program (ALCBSP) (Table 3). These sites as well as the potential activities may change in Year 1 and in subsequent years depending on where target species are nesting and what management activities are determined to be most effective at a particular location. ADCNR, DOI and the selected contractor implementing the project will meet annually prior to nesting season to determine target locations and actions. In the event birds are not present in a previously identified location, new locations will be identified. In addition to site locations varying from year to year, monitoring frequency for parameters will also vary based on priority locations. For example, monitoring nests on an island may be conducted less frequently than a site that is more easily accessed. Additional parameters will be collected on standardized data sheets as part of the project; these data sheets will be appended to the MAM Plan when available. This MAM Plan will be updated on a yearly basis to reflect additional information as it is available prior to the start of nesting season. Standardized data sheets will be developed to conduct monitoring for parameters identified below.

2.1 Monitoring Parameters

Objectives	Parameter	Purpose	Method	Timing, Frequency, Duration	Performance Criteria	Potential Corrective Action(s)
1: Reduce anthropogenic disturbances to colonial beach nesting birds and solitary beach nesting birds.	Symbolic fencing and outreach	Monitor progress toward meeting the restoration objective.	Record # acres fenced; Record # hours/ people contacted and type of outreach	Monthly for the duration of the project	No human encroachment into fenced areas	Reevaluate efficacy of treatment methods to advise future efforts (e.g. add additional fencing/ outreach).
2: Address threats to birds from mammalian predators.	Prevalence of predators	Monitor progress toward meeting the restoration objective.	Visual observation of predators (photos, tracks, scat) and depredation (eggs, nests, birds)	Areas checked mornings approx. biweekly during nesting season for duration of project	Annual decreases in prevalence of predators over course of project	Reevaluate methods and results to advise future efforts.

Objectives	Parameter	Purpose	Method	Timing, Frequency, Duration	Performance Criteria	Potential Corrective Action(s)
3: Conduct habitat enhancements in nesting areas.	Vegetation % survival; Area	Monitor progress toward meeting the restoration objective.	Calculate percent survival or any planted vegetation; Calculate area of enhanced habitat through vegetation enhancements, shell hash placed and/or decoys	Baseline, then yearly for three years	Increase in habitat area and/or quality	Reevaluate methods and results to advise future efforts.
4: Conduct monitoring at select nest sites	Bird densities	Monitor progress toward meeting the restoration objective.	Visual count methods by age class as outline in FSA breeding bird protocol	Once/week throughout nesting season	Annual use of sites by breeding shorebirds	Reevaluate methods and results to advise future efforts.

Table 2: Monitoring Schedule

Monitoring Parameter	Objective(s)	Pre-Execution Monitoring	As-Built (year 0)	Project Monitoring (Years 1-3)
MONITORING PARAMETERS APPLICABLE TO ALL SITES				
Parameter 1: Symbolic fencing and outreach	**1,4**			**X**
Parameter 2: Prevalence of predators	**2**			**X**
Parameter 3: Vegetation % survival	**3**	**X**	**X**	**X**
Parameter 4: Area	**3**		**X**	**X**
Parameter 5: Bird densities	**1,2,3,4**			**X**

3. ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed

outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. Adaptive management should not be used for projects where learning is unlikely, where decisions are irreversible, or where no opportunity exists to revise or reevaluate decisions based on new information (Doremus et al. 2011).

This alternative has a high likelihood of improving the protection of coastal habitats that are critically important to the nesting success and reproduction of four bird species injured by the DWH oil spill. The proposed stewardship, habitat, and nesting area enhancement approaches have already been demonstrated to be effective along the Gulf Coast and around the country (Burger et al., 2004; Johnson, 2016). Predator control and management programs are a widely used tool for increasing nest success for beach nesting birds and have been implemented by federal Trustee agencies along the Gulf coast (DWH Trustees, 2013; Florida Trustee Implementation Group [FL TIG], 2019). Decoy programs of the type proposed as part of this alternative have been demonstrated effective for establishing new nesting sites for beach nesting birds (Kotliar and Burger, 1984). The Trustees anticipate the alternative's overall likelihood of success would be further improved by implementing the monitoring and adaptive management component to provide essential data for further targeting the stewardship and predator management activities over the 3-year life of the initiative.

The ALTIG is taking an adaptive approach to this project in order to maximize benefits over time. See Section 2 above for more information on this approach. The ALTIG has preliminarily identified a number of potential target locations based on previous nesting data compiled under the National Fish and Wildlife Foundation Gulf Environmental Benefit Fund- funded Alabama Coastal Bird Stewardship Program (ALCBSP) (Table 3). These sites as well as the potential activities may change in Year 1 and in subsequent years depending on where target species are nesting and what management activities are determined to be most effective at a particular location. See Section 2 above for more information related to how the ALTIG will adaptively manage the project.

Table 3: Potential Project Areas, Activities, and Species

Potential Areas	Potential Activities	Potential Species
Tern Island Pelican Island • Marsh Island • Coffee Island • Cat Island[a] • Alabama Point • BSNWR • Gulf State Park • Dauphin Island West End[a] • Lower Perdido Islands • Additional/other sites to be determined	• Erect signage • Install symbolic and/or exclusionary fencing; • Provide active stewardship to reduce human and predator disturbance; • Conduct predator management; and Install shell hash and/or plantings to encourage nesting; • Other activities as appropriate.	• Black skimmer • American oystercatcher • Least tern • Reddish egret • Brown pelican • Least tern • Snowy plover • Wilson's plover • Great blue heron • Other species as appropriate

[a] This property is currently under private ownership and would require consent and cooperation from the landowner for access. In the event that appropriate access cannot be obtained for this property, these activities would be redirected to another appropriate location if possible.

4. EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed. As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project objectives achieved? If not, is there a reason why they were not met?
- Did project activities undertaken produce unanticipated effects?
- Were there unanticipated events unrelated to the project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?
- In areas where predator management activities were implemented, did nesting success increase, if nest fate was ascertained?

- Did the number of disturbance events change over time as stewardship actions were implemented?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan will be made if needed.

5. DATA MANAGEMENT

5.1 Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 (DWH NRDA Trustees 2017). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field 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. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file 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 will be made and the original preserved.

5.2 Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used 8 for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

5.3 Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

5.4 Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and

therefore will not be publicly distributed. Data will be formatted in accordance with machine-readable acceptable formants, per the Evidence Based Policy Making Act (Public Law 115-435).

6. REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface. A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

7. ROLES AND RESPONSIBILITIES

ADCNR is the Implementing Trustee agency for this project and will ensure that the project is completed and implemented. ADCNR will be responsible for monitoring progress of towards each parameter and will provide regular reports documenting the progress and results of each parameter. Reports provided by Third Party Contractor and the City of Orange Beach will be qualitative and quantitative and will be in a format which is easily interpreted and transcribed into DIVER at least annually and in accordance with Section 5, above.

DOI will consult.

ADCNR, the Third-Party Contractor and DOI will collaboratively develop priority locations and activities for work to be conducted on an annual basis, prior to nesting season.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

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9. MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name

E-7: MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT
Dauphin Island West End Acquisition

1. PROJECT OVERVIEW

There would be no proposed infrastructure or recreational activity improvements to this property; however, passive recreational access would remain. The property would be maintained as natural habitat and as a protected area for DWH injured bird species, including the piping plover and least tern. A bird conservation management plan would be developed for the parcel to identify management measures and restoration actions that could reasonably be expected to improve species productivity and/or habitat quality and availability. Management activities designed to facilitate bird production could include active stewardship (e.g., education and outreach, symbolic fencing and wildlife viewing activities), habitat enhancements, temporary or permanent symbolic fencing during nesting season closures and/or predator exclusion (non-electric) fencing.

Due diligence and land acquisition would take approximately 6 months to 1.5 years to complete. During the acquisition process and with the current owner's approval, continued monitoring would occur to collect data on the frequency of bird usage for loafing, nesting, foraging, and breeding on the property as a part of the Stewardship of Coastal Alabama Beach Nesting Bird Habitat Project proposed in this plan (Section 2.7.1).

No infrastructure or improvements are proposed at this property. It would be maintained as natural habitat and would serve as a protected area for injured bird species, including the piping plover and least tern. The bird conservation management plan will identify and prioritize management and restoration activities that would also be implemented as part of this proposed project.

1.1 Restoration Type Goals and Project Restoration Objectives

- **Programmatic Goal:** Replenish and protect living coastal and marine resources.
- **Restoration Type:** Birds
- **Restoration Type Goal:** Restore and protect habitat on which injured birds rely.
- **Restoration Approaches:** Restore and conserve bird nesting and foraging habitat.
- **Restoration Technique(s):** Acquire lands for conservation. Develop and implement management actions.

Objective 1: Acquire lands for bird nesting and foraging habitats.

Objective 2. Develop a management plan for restoring and/or enhancing target bird species and their associated habitats.

Objective 3. Implement restoration and management activities.

1.2 Conceptual Setting and Anticipated Outcomes

A conceptual model 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 outcome. The purpose of the conceptual setting within a Monitoring and Adaptive Management (MAM) Plan is to identify, document and communicate interactions and linkages among system components at the

project site and to understand how these system components may be affected by associated restoration actions.

Due to the size and undeveloped, isolated character of the property, acquisition would provide valuable habitat for breeding, migrating and resident bird populations, including large and important shorebird and colonial wader populations. Selection of the project as a preferred alternative would be dependent on a reasonable expectation that future funding would be available for additional bird restoration activities on the property. These activities could include predator control, stewardship activities and habitat enhancements to promote bird populations. In addition, Mobile County, in consultation with ADCNR and other entities, would develop a bird conservation management plan, including an assessment of habitat suitability and quality, bird species diversity and use information and a prioritized list of management actions and potential restoration projects that could reasonably be expected to improve species productivity and/or habitat quality and availability. The conceptual model outlined below includes potential actions that would result in positive long-term outcomes for target species.

Table 1: Conceptual Model

Activity	Output	Short-term Outcome	Long-term Outcomes
Acquisition of Tract	Tract is acquired.	Additional acreage of bird habitat is publicly owned and therefore able to be managed for the benefit of DWH injured bird species.	• Increased habitat connectivity • Enhanced habitat quality and availability for target bird species • Enhanced bird forage base • Enhanced bird diversity • Enhanced bird reproductive success • Improved resiliency and sustainability of coastal habitat
Completed management plan	Management plan is completed.	Management and habitat enhancement activities are identified and prioritized for future implementation that could include but are not limited to: -Create or restore bird nesting and/or foraging habitat -Reduce sediment loss and erosion -Renourish beaches through sediment addition -Reduce anthropogenic impacts to species through active stewardship activities -Reduce predation of nests and hatchlings -Enhance habitat through vegetation management (dunes/swales, mudflats/washover areas and/or back barrier marshes)	

1.3 Sources of Uncertainty

Drivers are outside forces, natural or anthropogenic, that have the potential to influence the outcomes of a restoration project (DWH NRDA Trustees 2017b: Section E.6.3). Drivers tend to be large-scale, long-term forces that are not easily controlled at the scale of a single restoration project (Harwell et al. 2016).

When evaluating the proposed project, the following outside drivers and stressors were considered:

- Adjacent development/land use
- Wave dynamics
- Sea level rise
- High intensity storm events
- Sky glow/artificial lighting

This list should not be considered exhaustive; additional drivers may be identified as the project is implemented and/or monitored. These drivers may affect the achievement of the restoration goals and objectives of the project. For example, if the intensity and frequency of hurricanes increase in the region, or if there is an increase in the rate of sea level rise, nesting areas on the island could be impacted. Dauphin Island, like many other barrier islands and coastal resources in the Gulf of Mexico, are vulnerable to a number of threats including hurricanes, oil spills, anthropogenic impacts and accelerating sea level rise (Enwright et al. 2017). If any drivers and/or stressors are negatively impacting the project, adaptive management may be necessary to ensure the project's goals and objectives are being achieved. The adaptive management strategy for the project is outlined below.

Uncertainties or information gaps have the potential to affect adaptive management decisions for individual or multiple restoration projects. These decisions may include how to improve the likelihood of achieving favorable project outcomes or selecting corrective actions in the event a project is not performing as intended. The following are example uncertainties that may be applicable to this project. This list should not be considered exhaustive; additional uncertainties may be identified as many uncertainties exist around bird responses to various restoration techniques (NAS 2017).

- Availability of property (willing seller)
- Land use change
- Sustainability of long-term project management (e.g., continued funding)
- Frequency of high intensity overwash or nest site flooding
- Short-and long-term fate of natural and/or placed material
- Natural variability in ecological and physical processes, such as wave-driven transport or vegetation growth, and in the associated barrier island response (e.g., geomorphic variability and barrier island evolution)

The alternative's goal of protecting, conserving, and restoring the West Dauphin property has a high likelihood of success. The land proposed for acquisition has a willing seller, and it is anticipated that final negotiations would lead to its acquisition at a reasonable price. Land acquisitions of this type are a proven approach for achieving conservation goals. The anticipated future restoration techniques have been widely and successfully implemented. Mobile County, which would own and manage the property, already owns other properties managed for conservation objectives. The transfer of the property to the county would include a permanent land protection instrument to ensure protection and maintenance of the property in perpetuity. Public ownership of the land will allow landowners to manage the property

for the benefit of target avian species. The completion of a management plan will address these uncertainties and allow for an adaptive approach to management and restoration actions that take into account drivers and uncertainties.

2. PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives. The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

The monitoring parameters below are directly related to assessing the performance of the proposed project activities, which include acquisition of the parcel and the development of a management plan. When management and/or restoration activities are identified and subsequently funded, performance monitoring directly related to the implementation of those actions will be developed and this MAM Plan will be revised accordingly. Regardless of the funding source utilized to fund future bird restoration activities on the parcel, the landowner would provide annual summary reports of project activities and results implemented under the management plan to the ALTIG for a period of ten years after acquisition of the parcel. Additionally, initial monitoring and stewardship activities for the West End of Dauphin Island are currently proposed in the Stewardship of Coastal Alabama Beach Nesting Bird Habitat. If selected for implementation, the data collected for that project's performance monitoring will be utilized in the development of management and restoration options for the tract. This MAM Plan will be updated over time as new data becomes available and as management and restoration activities are identified for implementation with proposed funding.

Parameter 1: Acquisition of Parcel

a. Purpose: To verify acquisition of tract.
b. Method: Submission of executed acquisition documents, such as a deed.
c. Timing and Frequency: Once upon completion of acquisition.
d. Sample Size: NA
e. Sites: West Dauphin Tract.
f. Performance Criteria: Executed acquisition document including bird conservation in perpetuity language in the deed.
g. Corrective Action(s): If property cannot be purchased, project will not move forward.

Parameter 2: Area

Purpose: Determine area of habitat acquired.

a. Method: Information provided from purchase documents and/or survey.
b. Timing and Frequency: Once upon completion of acquisition.
c. Sample Size: Entire tract.
d. Sites: West Dauphin Tract.
e. Performance Criteria: 837 acres acquired.
f. Corrective Action(s): NA

Parameter 3: Completed Management Plan

a. Purpose: To prioritize and plan management and restoration actions for the parcel.
b. Method: Provide copy of management plan to ALTIG
c. Timing and Frequency: Completed by end of Year 1.
d. Sample Size: NA
e. Sites: West Dauphin Tract.
f. Performance Criteria: Plan includes a conceptual model, a synthesis of existing data, an assessment of habitat suitability and quality, bird species and habitat use information. Plan provides a prioritized list of management actions and potential restoration activities that could reasonably be expected to improve species productivity and/or habitat quality and availability.
g. Corrective Action(s): Revise and update as needed.

The schedule for project monitoring is shown in Table 2, separated by monitoring activity. Pre-execution monitoring will occur before project execution. As-built monitoring occurs when project has been fully executed as planned. Project monitoring will occur in the years following initial project execution.

Table 2: Monitoring Schedule

Monitoring Parameter	Objective(s)	Pre-Execution Monitoring	As-Built (year 0)	Project Monitoring (Years 1-3)
Acquisition of Parcel	**1**		**X**	
Area	**1, 2**		**X**	
Management Plan	**2, 3**			**X**

3. ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed

outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. Adaptive management should not be used for projects where learning is unlikely, where decisions are irreversible, or where no opportunity exists to revise or reevaluate decisions based on new information (Doremus et al. 2011).

The alternative's goals of protecting, conserving, and restoring the West Dauphin property have a high likelihood of success. The land proposed for acquisition has a willing seller, and it is anticipated that final negotiations would lead to its acquisition at a reasonable price. Land acquisitions of this type are a proven approach for achieving conservation goals. The anticipated future restoration techniques have been widely and successfully implemented. Mobile County and the Town of Dauphin Island, which would jointly manage the property already own other properties managed for conservation objectives. Joint ownership and management would require a careful delineation of the roles and responsibilities of each of the parties. Both parties, however, are fully committed to developing a workable plan as part of the future management planning process that would occur in advance of the acquisition, and both entities have expensive experience in land management which lends to a high likelihood of successful completion. The transfer of the property into joint ownership would include a permanent land protection instrument to ensure protection and maintenance of the property in perpetuity. While barrier islands are dynamic geological structures (Morton 2008), public ownership would prevent impediments to natural migration that would allow future bird habitat to be maintained as sea level rise and storms alter coastal morphology.

The development of a management plan would reduce key uncertainties through the collection and compilation of data and information to inform the selection, design and optimization of future project portfolios. This approach may evolve over time as Trustees gain new insight and knowledge from restoration activities. This project supports an adaptive management approach to bird restoration by utilizing existing data to support the selection of the parcel for the purpose of restoring injured avian species. A 2017 assessment of habitat types by the U.S. Geological Survey provides important baseline information about the types and extent of habitat within the proposed tract, to help inform the identification of restoration activities (Figures 1 and 2). Previous bird surveys were also reviewed, including Zdravkovic 2007 and 2012.

In 2018, volunteers with the Birmingham Audubon Society conducted monitoring at the West End of Dauphin Island (BAS 2019, ebird 2019). Of the avian species identified in the proposed acquisition area, 49 were identified as species injured species as a result of the oil spill in the Final Programmatic Damage Assessment and Restoration plan (PDARP) and final programmatic environmental impact statement (PEIS) (DWH NRDA Trustees 2016a). This collection of baseline data will support the development of the management plan. This project proposes to provide $500,000 for implementation of the bird conservation and management plan. Completing the plan prior to the expenditure of funds for bird restoration activities is part of an adaptive management approach to restoration.

Table 3. Avian species identified at the West End of Dauphin Island by Birmingham Audubon Society that were also listed as species injured by the oil spill in the PDARP/PEIS. Source: Ebird, 2019.

American Oystercatcher	Belted Kingfisher	Black Skimmer	Black Tern	Black-crowned Night-Heron	Blue-winged Teal
Brown Pelican	Bufflehead	Caspian Tern	Cattle Egret	Clapper Rail	Common Loon
Double-crested Cormorant	Dunlin	Forster's Tern	Great Blue Heron	Great Egret	Greater/Lesser Scaup
Green Heron	Gull-billed Tern	Herring Gull	Killdeer	Laughing Gull	Least Sandpiper
Least Tern	Mallard	Mottled Duck	Northern Gannet	Osprey	Piping Plover
Red-breasted Merganser	Reddish Egret	Red-winged Blackbird	Ring-billed Gull	Royal Tern	Ruddy Turnstone
Sanderling	Sandwich Tern	Seaside Sparrow	Semipalmated Plover	Semipalmated Sandpiper	Short-billed Dowitcher
Snowy Egret	Snowy Plover	Spotted Sandpiper	Tricolored Heron	Willet	Wilson's Plover
					Yellow-crowned night heron

Table 4: Avian Species identified at West End of Dauphin Island 2008-2010 by Zdrakovic (2007), Zdrakovic (2012)

	Snowy Plover Pairs	Wilson's Plover Pairs	American Oystercatcher Pairs	Least Tern Pairs
2007	2	3	0	16
2008	2	3	3	0
2009	6	3	3	5
2010	4	2	5	10

Figure 1. Habitats of the eastern portion of proposed acquisition area (adapted from Enwright et al. 2017)

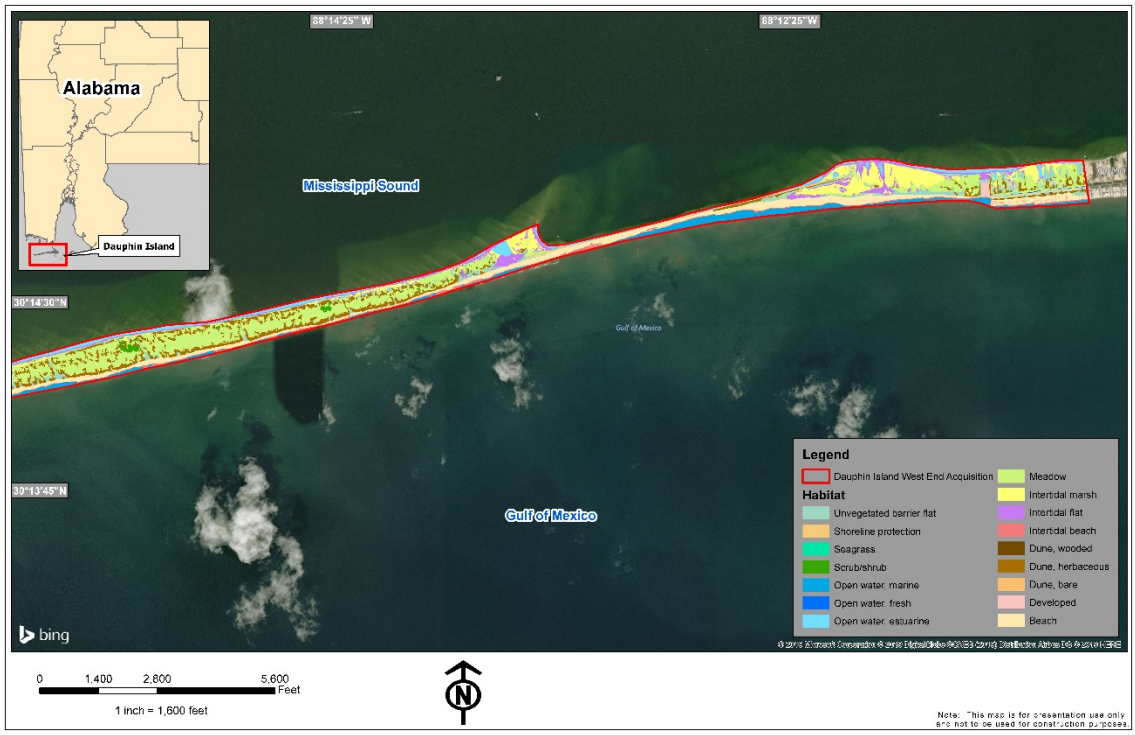
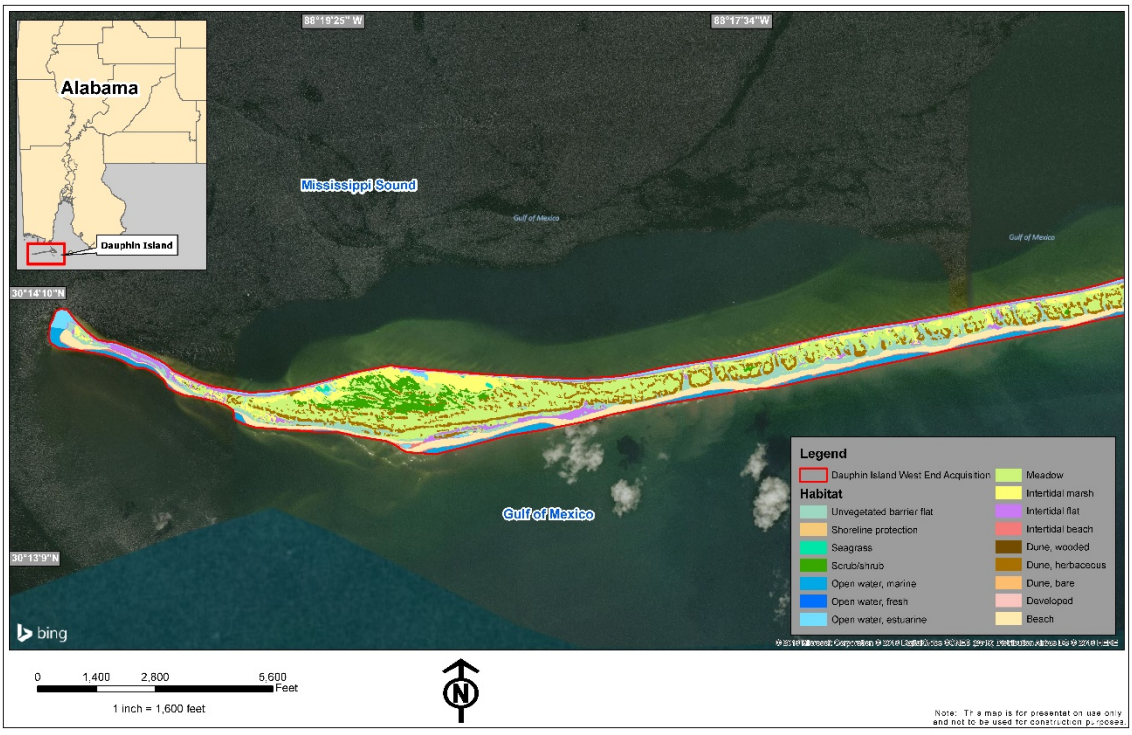


Figure 2: Habitats of the western portion of proposed acquisition area (adapted from Enwright et al., 2017)



4. EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed. As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project objectives achieved? If not, is there a reason why they were not met?
- Did project activities undertaken produce unanticipated effects?
- Were there unanticipated events unrelated to the project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan will be made if needed.

5. DATA MANAGEMENT

5.1 Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 (DWH NRDA Trustees 2017b). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field 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. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file 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 will be made and the original preserved.

5.2 Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual

Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

5.3 Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

5.4 Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

6. REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface. A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

7. ROLES AND RESPONSIBILITIES

ADCNR is the lead Implementing Trustee for this project and will ensure the project is completed.

ADCNR, Mobile County, Town of Dauphin Island, and DOI will collaboratively develop the framework for the management plan. ADCNR will host an annual planning meeting for interested Trustees.

Mobile County will hold the property. Mobile County and the Town of Dauphin Island will facilitate management activities. Mobile County will be responsible for monitoring progress towards each parameter and will provide regular reports documenting the progress and results of each parameter. Reports provided by Mobile County will be qualitative and quantitative and will be in a format which is easily interpreted and transcribed into DIVER at least annually and in accordance with Section 5, above.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

8. REFERENCES

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9. MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name

Appendix F-1
Oil Pollution Act Criteria Considerations

In applying the Oil Pollution Act (OPA) criteria, the Alabama Trustee Implementation Group (AL TIG) took into account the following considerations.

1. **Trustee goals and objectives.** The OPA analysis addresses 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. This encompasses the Final Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS) goals and approaches for the two resource types considered in this restoration plan as well as restoration goals tailored to the Alabama Restoration Area by the AL TIG and, where available, information provided by the Strategic Frameworks developed by the Trustees. Under this criterion, the focus is on each restoration alternative's nexus to the relevant injuries as described in the Final PDARP/PEIS, and the nature, magnitude, and impact of the recreational use and/or ecological benefits that the alternative is expected to provide the public.
2. **Cost to carry out the alternative**. The Trustees consider whether the full costs of the alternative over the life of the project (including land acquisition, restoration, training, associated studies, staffing, engineering and design (E&D), construction, management, monitoring, maintenance, and contingency) are clearly specified and described. In addition, the analysis determines whether the costs of the alternative are reasonable, appropriate, and comparable to other equivalent restoration alternatives.
3. **Likelihood of success**. The Trustees consider factors bearing on a project's likelihood of success as part of their decision about whether to recommend a project for implementation. Examples of important questions for evaluating likelihood of success include: Does an alternative propose approaches or techniques that the Trustees have previously executed successfully? Is the restoration approach or technique routinely used? Are there significant permitting or other impediments to implementation or successful realization of project benefits at this time in Alabama?
4. **Prevents future injury and avoids collateral injury.** OPA requires evaluating the extent to which each alternative would prevent future injury as a result of the incident and/or avoid collateral injury as a result of implementing the alternative. None of the alternatives considered in this Restoration Plan III and draft Environmental Assessment: Provide and Enhance Recreational Opportunities, and Birds (RP III/EA) prevent future injuries from the incident. For the OPA analysis, the AL TIG's analysis focuses on whether the restoration alternative has the potential to cause direct or indirect collateral environmental injuries. These considerations are covered in detail in the "Environmental Consequences" sections of this draft RP III/EA (Chapters 5 and 6).
5. **Benefits more than one natural resource/service.** Although the projects considered in RP III/EA generally are funded from only a single Resource Type allocation, the AL TIG considers the importance of multiple resource benefits by evaluating whether alternatives convey multiple ecosystem service benefits that make them more valuable to the public. Examples might include Recreational Use projects that potentially benefit birds, turtles, or marine mammals because they acquire and preserve habitat.

6. **Effects on public health and safety.** The AL TIG considers whether any aspects of the alternative could affect public health and safety. The focus is on adverse impact to public health that cannot be effectively mitigated when the project is implemented.

Appendix F-2
Oil Pollution Act Criteria Consideration—Recreational Use Projects

For each alternative, the OPA criteria are evaluated independently, and a determination is made on how well the alternative meets that element. The AL TIG applied each of the OPA criteria to the reasonable range of alternatives in this section to provide (1) a summary explanation of the types of questions and analysis raised under each of the OPA criteria, and (2) a narrative summary of each alternative's evaluation with respect to those criteria.

1. **The cost to carry out the alternative**. The analysis of the AL TIG addresses the following questions. Is there a description of the anticipated costs of the alternative? Are the costs of the alternative (including land acquisition, design, construction, management, monitoring, and maintenance) reasonable, appropriate, and comparable to other equivalent restoration alternatives?

2. **The extent to which each alternative is expected to meet the AL TIG's goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses.** The AL TIG's analysis addresses the restoration alternative's nexus to the lost recreational shoreline use injury as described in the Final PDARP/PEIS while also evaluating the nature, magnitude, and distribution of the recreational benefits expected to be provided to the public by each alternative. Measures of the magnitude of the recreational benefit (where available and appropriate) can include number of acres, miles of shoreline, number of expected user days, and a measure of the value conveyed to users. The distribution of benefits considers the extent to which the alternative provides benefits to various subgroups within the injury population. Each of the following components of this element are evaluated independently and qualitatively, where appropriate:

   Nexus to Injury: Alternatives are evaluated on their ability to benefit individuals who visit Alabama coastal areas for the primary purpose of engaging in coastal shoreline recreation. An additional focus is placed on users of natural resources accessed via sandy beach areas or in close proximity to sandy beach areas (because this was the predominant use category described in the Final PDARP/PEIS [see Section 4.10]).

   Benefit to Injured Resources: Each of the following points capture elements necessary to evaluate the relative benefits of the restoration alternatives:

   - **Component Benefits—**What are the anticipated recreational benefits of the alternative? What are the alternative attributes that are expected to increase or improve the shoreline recreational experience? Are any of these attributes supported by peer-reviewed economics literature? Examples of attributes that are expected to increase or improve recreational use experiences include:
     - beach width,
     - reductions in marine debris,
     - new or improved access points (e.g., dune walkovers, parking),
     - improved water quality,
     - amenities (e.g., bathrooms, bike paths, showers),
     - fishing piers,

  - parks and open space (e.g., land preservation with access component),
  - reduced crowding, and
  - environmental education and stewardship opportunities.

- **Scale of Benefits—**What is the scale of the anticipated recreational benefits? What information is available on the level of current use at the alternative site and the beneficial impacts expected after implementation of the alternative (e.g., increases in visits to a site, number of individuals experiencing enhanced recreational values, changes in acreage of available recreational areas, number of new access points)? What is the timing of the anticipated benefits?
- **Public Access—**How will members of the public be able to access the benefits from the proposed alternative?
  - Can users be excluded from enjoying the benefits of an alternative? Do any potential exclusions disproportionately affect any demographic subset of the population?
  - If there is a user-access fee, how is it set?
    - Profit-maximizing (i.e., prices are set to capture user willingness-to-pay),
    - Cost-neutral (i.e., a nominal price is set to cover on-site maintenance costs), and
    - Capacity-controlling pricing schedule (i.e., prices set to encourage turnover and limit on-site congestion).
  - What are the implications on user value from this pricing schedule?
  - Are there any anticipated accounting profits, and if so, are they spent on OPA-applicable alternatives or maintenance?
- **Location—**Where is the alternative located? Considerations for siting restoration include:
  - Availability of substitutes (e.g., if there are fewer nearby available sites that provide similar recreational benefits, the alternative may convey a higher value)
  - Uniqueness of restoration (e.g., if the recreational amenities proposed are unique it may lead to more long-distance trips to the site and possibly result in a higher per-trip value)
- **Additional Benefit Considerations—**What is the magnitude of additional benefits from the alternative in comparison to the existing state of the resource? For example:
  - Will additional access lead to increased crowding?
  - Is it clear that alternatives are not redundant?
  - Will marginal environmental quality improvements convey benefits? (e.g., for water quality alternatives, is there sufficiently impaired water quality in the area?).

3. **The likelihood of success of each alternative.** Does the alternative propose restoration approaches or techniques that the AL TIG have previously executed successfully? Is the restoration approach or technique routinely used? How did these past experiences inform the development of the alternative so as to increase its likelihood of success? For novel or new techniques, have the AL TIG incorporated any measures to minimize risk? Have AL TIG considered the uncertainties influencing success and any adaptive management approaches that would address those uncertainties?

Considerations likely leading to success are dependent on alternative types. For example, for land acquisition alternatives, key predictors of success include whether there is a willing seller, whether there is continuity to other conservation areas, and whether the property will be managed to increase or improve access to resources. For infrastructure alternative types, key predictors include whether the infrastructure provides increased access to resources, whether there is a mechanism for long-term maintenance and management of the alternative, and whether there are mechanisms in place to ensure that the alternative will remain publicly accessible over the long term.

4. **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.** Does the restoration alternative have direct or indirect collateral environmental impacts (positive or negative)? Many of these considerations are covered in the "Affected Environment" and "Environmental Consequences" sections of this document (Chapters 4 and 5).
5. **The extent to which each alternative benefits more than one natural resource and/or service.** Although each alternative is funded exclusively from one Restoration Type allocation, the AL TIG considered the importance of multiple resource benefits by evaluating whether alternatives convey multiple ecosystem service benefits (in addition to recreational use) that make them more valuable to the public (e.g., non-use (ecological) values, storm-protection benefits, and habitat/resource improvements that may benefit ecological resources injured by the Deepwater Horizon [DWH] oil spill).
6. **The effect of each alternative on public health and safety.** The AL TIG considered whether there are any aspects of the alternative that could negatively affect public health and safety that cannot be mitigated.

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Appendix G
Impact Threshold Matrix

Table G-1: Impact Thresholds Used in for the Analysis of Environmental Consequences, as Presented in the Final Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS)

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
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 on 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 widespread area. Impacts on geology or soils could be readily apparent and could result in changes to the character of the geology or soils over a widespread area. Erosion and compaction could occur over a widespread 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	Hydrology: The effect on hydrology could be measurable, but small and limited to local and adjacent areas. The effect could permanently alter the area's hydrology, including surface and groundwater flows. Water quality: Impacts on 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, it 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	Hydrology: The effect on hydrology could be measurable and widespread. 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 widespread. Impacts could likely result in exceedance of state water quality standards and/or could impair designated uses of a waterbody. Floodplains: Impacts could result in a change to natural and beneficial floodplain values that could have substantial consequences over a widespread area. Location of operations could increase risk of

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
		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 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.	adjacent areas. Location of operations in floodplains could increase risk of flood loss, including impacts on human safety, health, and welfare. Wetlands: The action could cause a measurable effect on wetlands indicators (size, integrity, or 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.	flood loss, including impacts on human safety, health, and welfare. Wetlands: The action could cause a permanent loss of wetlands across a widespread area. The character of the wetlands could be changed so that the functions typically provided by the wetland could be permanently lost.
Air Quality	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 United States Environmental Protection Agency's (USEPA) de minimis criteria for a general conformity determination under the Clean Air Act (40 CFR 93.153).	The impact on air quality could be measurable and limited to local and adjacent areas. Emissions of criteria pollutants could be at USEPA's de minimis criteria levels for general conformity determination.	The impact on air quality could be measurable over a widespread area. Emissions would be high, such that they could exceed USEPA's de minimis criteria for a general conformity determination.
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 widespread areas. Noise levels could eliminate or discourage user activities.

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
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 could be limited to localized areas. Infrequent disturbance to individual plants could be expected but would not affect 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 measurable but limited to local and adjacent areas. Occasional disturbance to individual plants could be expected. These disturbances could adversely affect local populations but are not expected to affect regional population stability. Some impacts might occur in key habitats, but sufficient local 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.	Impacts on native vegetation could be measurable and widespread. Frequent disturbances of individual plants could be expected, with adverse impacts on both local and regional population levels. These disturbances could adversely affect range-wide population stability. Some impacts might occur in key habitats, and habitat impacts could adversely affect the viability of the species both locally and throughout its range. Actions could result in the widespread increase of non-native species and result in broad and permanent changes to native species populations and distributions.
Wildlife	Short-term: Lasting up to two breeding seasons, depending on length of breeding season. Long-term: Lasting more than two breeding seasons.	Impacts on 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 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	Impacts on native species, their habitats, or the natural processes sustaining them could be measurable but limited to local and adjacent areas. Occasional responses to disturbance by some individuals could be expected, with some adverse impacts on feeding, reproduction, resting, migrating, or other factors affecting local population levels. Some impacts might occur in key habitats. However, sufficient population numbers or habitat could retain function to maintain the viability of the species both locally and throughout its range.	Impacts on native species, their habitats, or the natural processes sustaining them could be detectable and widespread. Frequent responses to disturbance by some individuals could be expected, with adverse impacts on 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 could result in direct mortality or loss of habitat that might affect the viability of a species. Local population numbers, population

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
		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 these species could not displace native species populations and distributions.	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.	structure, and other demographic factors might experience large changes or declines. Actions could result in the widespread increase of non-native species and result in broad and permanent changes to native species populations and distributions.
Marine and Estuarine Fauna	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 as 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 these species 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 widespread increase of non-native species and result in broad and permanent changes to native species populations and distributions.

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
Rare and Protected Species	Short-term: Lasting up to one breeding/growing season. Long-term: Lasting more than one breeding/ growing season.	Impacts on rare and protected species, their habitats, or the natural processes sustaining them could be detectable but would be small and 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 Endangered Species Act (ESA)-listed species.	Impacts on rare and protected species, their habitats, or the natural processes sustaining them could be detectable, and some alteration in the numbers of protected species or occasional responses to disturbance by some individuals could be expected, with some adverse impacts on 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 their range. Some disturbance to individuals or impacts on potential or designated critical habitat could occur. Impacts could likely result in a "may affect, likely to adversely affect" determination for at least one ESA-listed species. No adverse modification of critical habitat could be expected.	Impacts on protected species, their habitats, or the natural processes sustaining them could be detectable, widespread, and permanent. Substantial impacts on the population numbers of protected species, or interference with their survival, growth, or reproduction could be expected. There could be impacts on 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 ESA-listed species.

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
Federally Managed Fisheries	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 managed fish species. Any disturbance could not interfere with key behaviors such as 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 these species could not displace native species populations and distributions.	Impacts could be readily apparent and result in a change to managed fish 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 managed fish 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 widespread increase of non-native species and result in broad and permanent changes to native species populations and distributions.
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 affected. 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 and low-income populations.	Many individuals, groups, businesses, properties, or institutions could be affected. 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 and low-income populations. However, the impact could be temporary and localized.	A large number of individuals, groups, businesses, properties, or institutions could be affected. Impacts could be readily detectable and observed, extend over a widespread area, and have a substantial influence on social and/or economic conditions. Actions could disproportionately affect minority and low-income populations, and this impact could be permanent and widespread.
Cultural Resources	Short-term: During construction period. Long-term: Over the life of the project or longer.	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.	Disturbance of a site(s), building, structure, or object not expected to result in a substantial loss of important cultural information.	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.

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
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 slowed traffic and delays, but no change in level of service. Short service interruptions (temporary closure for a few hours) to roadway and railroad traffic could occur.	The action could affect public services or utilities over a widespread 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 level of service to worsened conditions. Extensive service disruptions (temporary closure of one day or more) to roadways or railroad traffic could occur.
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 or zoning change or an amendment to a land use, area comprehensive, or management plan but could not affect overall use and management beyond the local area.	The action could require a variance or zoning change or an amendment to a land use, 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 widespread area.

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
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 recreationists. Users could likely be aware of the action but changes 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.	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 still available. The impact could be readily apparent and/or could affect many recreationists locally and in adjacent 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.	All developed site capacity could be eliminated because developed facilities could be closed and removed. Visitors could be displaced to facilities over a widespread area, and visitor experiences could no longer be available in many locations. The impact could affect most recreationists over a widespread area. Users could be highly aware of the action. Users could choose to pursue activities in other available regional areas.
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 viewshed 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 viewshed that was readily apparent and attracts attention. Changes could not dominate the viewscape, although 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.

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
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., increased likelihood of storm surge) to visitors, residents, and workers from decreased shoreline integrity could be temporary and localized.	Actions 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 pre-construction 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 (1) soil, groundwater, and/or surface water contamination at levels exceeding federal, state, or local hazardous waste criteria, including those established by 40 CFR 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) 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 the federal Occupational Safety and Health Administration in 29 CFR 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 widespread area.

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Appendix H
Rare and Protected Species and Federally Managed Fish Species Potentially in the Project Areas

Table H-1: Rare and Protected Species Potentially Occurring in the Project Areas

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Mammals						
Alabama Beach Mouse	*Peromyscus polionotus ammobates*	G5T1	S1	LE	SP	P1
Black Bear	*Ursus americanus*	G5T2	S2	-	-	P1
Bottlenose Dolphin	*Tursiops truncates*	G5	-	MMPA	-	N/A
Long-tailed Weasel	*Mustela frenata*	G5	S3	-	SP	P2
Marsh Rabbit	*Sylvilagus palustris*	G5T2	S3	-	-	P2
Northern Yellow Bat	*Lasiurus intermedius*	G4G5	S1	-	-	P2
Southeastern Pocket Gopher	*Geomys pinetis*	G5	S3	-	SP	P2
West Indian Manatee	*Trichechus manatus*	G2	S1	LE MMPA	SP	P1
Reptiles						
Alligator Snapping Turtle	*Macrochelys temminckii*	G3G4	S3	-	SP	P2
Eastern Coral snake	*Micrurus fulvius*	G5	S3	-	SP	P2
Eastern Diamond-backed Rattlesnake	*Crotalus adamanteus*	G4	S3	-	-	P2
Eastern Indigo Snake	*Drymarchon couperi*	G3	S1	LT	SP	P1, possibly extirpated
Eastern Kingsnake	*Lampropeltis getula*	G5T5	S4	-	SP	P2
Gopher Tortoise	*Gopherus Polyphemus*	G3	S3	C, LT	SP	P2
Green Sea Turtle	*Chelonia mydas*	G3	S1	LT	SP	P1
Hawksbill Sea Turtle	*Eretmochelys imbricata*	G2	N/A	LE	SP	N/A

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	G1	S1	LE	SP	P1
Leatherback Sea Turtle	*Dermochelys coriacea*	G2	N/A	LE	SP	P1
Loggerhead Sea Turtle	*Caretta*	G3	S1	LT	SP	P1
Mimic Glass Lizard	*Ophisaurus mimicus*	G3	S2	-	SP	P2
Mississippi Diamondback Terrapin	*Malaclemys terrapin pileate*	G4T3Q	S2	-	SP	P1
Rainbow Snake	*Farancia erytrogramma*	G4	S3	-	SP	P2
Amphibians						
One-toed Amphiuma	*Amphiuma pholeter*	G3	S1	-	SP	P2
River Frog	*Lithobates heckscheri*	G5	S1	-	SP	P1
Southern Dusky Salamander	*Desmognathus auriculatus*	G5	S2	-	SP	P1
Birds						
American oystercatcher	*Haematopus palliates*	G5	S1	-	SP	P1
American Woodcock	*Scolopax minor*	G5	S3B,S5N	-	-	P2
Bachman's Sparrow	*Peucaea aestivalis*	G3	S3	-	SP	P2
Bald Eagle	*Haliaeetus leucocephalus*	G5	-	BGEPA	-	-
Henslow's Sparrow	*Ammodramus henslowii*	G4	S2N	-	SP	P1
Least Bittern	*Ixobrychus exilis*	G5	S2N,S4B	-	SP	P2
Nelson's Sparrow	*Ammodramus nelson*	G5	S3N	-	SP	P2
Northern Harrier	*Circus cyaneus*	G5	S3N	-	SP	P2
Piping Plover	*Charadrius melodus*	G3	S1N	LT	SP	P1
Red Knot	*Calidris canutus*	G4	S3N	LT	SP	P2
Reddish Egret	*Egretta rufescens*	G4	S1B,S3N	-	SP	P2

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Seaside Sparrow	*Ammodramus maritimus*	G4	S2	-	SP	P2
Short-eared Owl	*Asio flammeus*	G5	S2N	-	SP	P2
Snowy Plover	*Charadrius nivosus*	G3	S1B,S2N	-	SP	P1
Swallow-tailed Kite	*Elanoides forficatus*	G5	S2	-	SP	P2
Wilson's Plover	*Charadrius wilsonia*	G5	S1	-	SP	P1
Wood Stork	*Mycteria Americana*	G4	S2N	LE	SP	P2
Fishes						
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	G3T2	S1	LT	SP	P2

Note: A conservation status for each listed species is given by its global rank (G) or state rank (S), as defined by NatureServe (NatureServe, 2017a, 2017b) and tracked by ALNHP. According to this ranking, the conservation status of each species is assigned a state (S) and global (G) rank that ranges from imperiled (G1 or S1) to secure (G5 or S5). If the taxon has a trinomial classification (e.g., subspecies), the global rank is followed by a trinomial (T) rank that also range from imperiled (T1) to secure (T5). “Q" at the end of the global rank indicates that there are taxonomic questions surrounding the taxon’s classification. For each species, it is also noted whether they are listed under the federal ESA as threatened (LT), endangered (LE), or candidates for listing (C). Species protected under the MMPA and BGEPA are also identified as such. The state of Alabama identifies species as Protected Species (SP). Lastly, the level of conservation priority (i.e., State Priority) is provided for species of greatest conservation need, which are identified in by the 2015 Alabama Wildlife Action Plan (ADCNR, 2015, 2017).

Table H-2: FMP Species Managed by NMFS near the Project Areas

Management Unit / Species	Lifestage(s) Found at Project Site(s)	NOAA Fisheries Management Plan
Red Drum (*Sciaenops ocellatus*)	All	Red Drum
Highly Migratory Species		
Scalloped hammerhead shark (*Sphyrna lewini*)	Neonate, Juvenile	Highly Migratory Species
Bonnethead shark (*Sphyrna tiburo*)	Neonate, Juvenile, Adult	Highly Migratory Species
Blacktip shark (*Carcharhinus limbatus*)	Neonate, Juvenile, Adult	Highly Migratory Species
Bull shark (*Carcharhinus leucas*)	Juvenile	Highly Migratory Species
Spinner shark (*Carcharhinus brevipinna*)	Juvenile	Highly Migratory Species
Atlantic sharpnose shark (*Rhizoprionodon terraenovae*)	Neonate, Juvenile, Adult	Highly Migratory Species
Finetooth shark (*Carcharhinus isodon*)	Neonate, Juvenile, Adult	Highly Migratory Species
Blacknose shark (*Carcharhinus acronotus*)	Adult	Highly Migratory Species
Great hammerhead shark (*Sphyrna mokarran*)	All	Highly Migratory Species
Shrimp		
Brown shrimp (*Farfantepenaeus aztecus*)	All	Shrimp
Pink shrimp (*Farfantepenaeus duararum*)	All	Shrimp
White shrimp (*Litopenaeus setiferus*)	All	Shrimp
Royal red shrimp (*Pleoticus robustus*)	All	Shrimp
Coastal Migratory Pelagics		
King mackerel (*Scomberomorus cavalla*)	All	Coastal Migratory Pelagics
Spanish mackerel (*Scomberomorus maculatus*)	All	Coastal Migratory Pelagics
Cobia (*Rachycentron canadum*)	All	Coastal Migratory Pelagics
Reef Fish		
Balistidae–Triggerfishes		
Gray triggerfish (*Balistes capriscus*)	All	Reef Fishes
Carangidae–Jacks		
Greater amberjack (*Seriola dumerili*)	All	Reef Fishes

Management Unit / Species	Lifestage(s) Found at Project Site(s)	NOAA Fisheries Management Plan
Lesser amberjack (*Seriola fasciata*)	All	Reef Fishes
Almaco jack (*Seriola rivoliana*)	All	Reef Fishes
Banded rudderfish (*Seriola zonata*)	All	Reef Fishes
Labridae–Wrasses		
Hogfish (*Lachnolaimus maximus*)	All	Reef Fishes
Lutjanidae–Snappers		
Queen snapper (*Etelis oculatus*)	All	Reef Fishes
Mutton snapper (*Lutjanus analis*)	All	Reef Fishes
Schoolmaster (*Lutjanus apodus*)	All	Reef Fishes
Blackfin snapper (*Lutjanus buccanella*)	All	Reef Fishes
Red snapper (*Lutjanus campechanus*)	All	Reef Fishes
Cubera snapper (*Lutjanus cyanopterus*)	All	Reef Fishes
Gray (mangrove) snapper (*Lutjanus griseus*)	All	Reef Fishes
Dog snapper (*Lutjanus jocu*)	All	Reef Fishes
Mahogany snapper (*Lutjanus mahogoni*)	All	Reef Fishes
Lane snapper (*Lutjanus synagris*)	All	Reef Fishes
Silk snapper (*Lutjanus vivanus*)	All	Reef Fishes
Yellowtail snapper (*Ocyurus chrysurus*)	All	Reef Fishes
Wenchman (*Pristipomoides aquilonaris*)	All	Reef Fishes
Vermilion snapper (*Rhomboplites aurorubens*)	All	Reef Fishes
Malacanthidae–Tilefishes		
Goldface tilefish (*Caulolatilus chrysops*)	All	Reef Fishes
Blackline tilefish (*Caulolatilus cyanops*)	All	Reef Fishes
Anchor tilefish (*Caulolatilus intermedius*)	All	Reef Fishes
Blueline tilefish (*Caulolatilus microps*)	All	Reef Fishes
Golden Tilefish (*Lopholatilus chamaeleonticeps*)	All	Reef Fishes
Serranidae–Groupers		
Dwarf sand perch (*Diplectrum bivittatum*)	All	Reef Fishes
Sand perch (*Diplectrum formosum*)	All	Reef Fishes
Rock hind (*Epinephelus adscensionis*)	All	Reef Fishes

Management Unit / Species	Lifestage(s) Found at Project Site(s)	NOAA Fisheries Management Plan
Speckled hind (*Epinephelus drummondhayi*)	All	Reef Fishes
Yellowedge grouper (*Epinephelus flavolimbatus*)	All	Reef Fishes
Red hind (*Epinephelus guttatus*)	All	Reef Fishes
Goliath grouper (*Epinephelus itajara*)	All	Reef Fishes
Red grouper (*Epinephelus morio*)	All	Reef Fishes
Misty grouper (*Epinephelus mystacinus*)	All	Reef Fishes
Warsaw grouper (*Epinephelus nigritus*)	All	Reef Fishes
Snowy grouper (*Epinephelus niveatus*)	All	Reef Fishes
Nassau grouper (*Epinephelus striatus*)	All	Reef Fishes
Marbled grouper (*Epinephelus inermis*)	All	Reef Fishes
Black grouper (*Mycteroperca bonaci*)	All	Reef Fishes
Yellowmouth grouper (*Mycteroperca interstitialis*)	All	Reef Fishes
Gag (*Mycteroperca microlepis*)	All	Reef Fishes
Scamp (*Mycteroperca phenax*)	All	Reef Fishes
Yellowfin grouper (*Mycteroperca venenosa*)	All	Reef Fishes