DEEPWATER HORIZON OIL SPILL
FLORIDA TRUSTEE IMPLEMENTATION GROUP

DRAFT RESTORATION PLAN 2 AND ENVIRONMENTAL ASSESSMENT: HABITAT PROJECTS ON FEDERALLY MANAGED LANDS; SEA TURTLES; MARINE MAMMALS; BIRDS; AND PROVIDE AND ENHANCE RECREATIONAL OPPORTUNITIES

FEBRUARY 2021

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EXECUTIVE SUMMARY

In the spring of 2010, the *Deepwater Horizon* (DWH) mobile drilling unit exploded resulting in loss of life and a massive release of oil and natural gas from the BP Exploration and Production, Inc. (BP) Macondo well. Extensive response actions, including cleanup activities and actions to prevent the oil from reaching sensitive resources, were undertaken; however, many of these response actions had collateral impacts on the environment and 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.

Pursuant to the Oil Pollution Act (OPA), Title 33 United States Code §§ 2701 *et seq*., and the laws of individual affected states, federal and state agencies, Indian tribes, and foreign governments act as trustees on behalf of the public to assess injuries to natural resources and their services[1] that result from an oil spill incident, and to plan for restoration to compensate for those injuries. Under the authority of OPA, the DWH Trustees conducted a natural resource damage assessment (NRDA) to assess the impacts of the DWH oil spill on natural resources and their services and prepared the 2016 *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan/Programmatic Environmental Impact Statement (PDARP/PEIS)[2] which outlines the type of restoration needed to compensate the public for the diverse suite of injuries that occurred at both regional and local scales as well as the funding allocations to each Restoration Type.

In the PDARP/PEIS, the Trustees identified the need for a comprehensive restoration plan at a programmatic level to guide and direct an ecosystem-level restoration effort, based on four programmatic Restoration Goals: Restore and Conserve Habitat; Restore Water Quality; Replenish and Protect Living Coastal and Marine Resources; and Provide and Enhance Recreational Opportunities. In addition, a fifth Restoration Goal, Provide for Monitoring, Adaptive Management, and Administrative Oversight to Support Restoration Implementation, supports the Restoration Types under the Restoration Goals and informs overall decision-making (see Figure 5.4-1 in the PDARP/PEIS).

Draft Restoration Plan 2 and Environmental Assessment

The Florida Trustee Implementation Group (FL TIG) is responsible for restoring natural resources and their services within the Florida Restoration Area that were injured by the DWH oil spill. The FL TIG includes Trustees from two state and four federal agencies: the Florida Department of Environmental Protection; the Florida Fish and Wildlife Conservation Commission; the United States Department of Commerce, represented by the National Oceanic and Atmospheric Administration; the United States Department of the Interior, represented by the United States Fish and Wildlife Service, National Park

[1] Services (or natural resource services) are defined as the functions performed by a natural resource for the benefit of another natural resource and/or the public (15 Code of Federal Regulations § 990.30).

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

Service, and Bureau of Land Management; the United States Department of Agriculture; and the United States Environmental Protection Agency.

The FL TIG has prepared this Draft Restoration Plan 2 and Environmental Assessment (RP/EA) to address, in part, injury to natural resources in the Florida Restoration Area as a result of the DWH oil spill. The purpose of restoration, as discussed in this document and detailed in the PDARP/PEIS, is to make the environment and the public whole by implementing restoration actions that return injured natural resources and their services to baseline conditions and compensate for interim losses, in accordance with OPA and consistent with associated OPA NRDA regulations. This RP/EA includes a description and evaluation of 24 restoration projects, also called restoration alternatives,[3] consistent with five of the Restoration Types from the PDARP/PEIS, as follows:

- Habitat Projects on Federally Managed Lands: five alternatives[4];
- Sea Turtles: four alternatives;
- Marine Mammals: two alternatives;
- Birds: five alternatives; and
- Provide and Enhance Recreational Opportunities: nine alternatives.[4]

Table ES-1 lists the reasonable range of alternatives, noting those that are preferred for funding by the FL TIG in this RP/EA.

Table ES-1 The reasonable range of restoration alternatives proposed in this RP/EA, by Restoration Type and location (west to east)

Reasonable Range of Restoration Alternatives		Estimated Project Costs
Restoration Type: Habitat Projects on Federally Managed Lands (FM)		
FM1. Johnson Beach Access Management and Habitat Protection	Preferred[a]	$3,200,000
FM2. Perdido Key Sediment Placement	Preferred	$6,773,000
FM3. Old Fort Pickens Road Utility Line Relocation	-	$1,249,930
FM4. Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits	Preferred	$540,000
FM5/REC6. St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass[4]	Preferred	$3,220,000
Restoration Type: Sea Turtles (ST)		
ST1. Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast	Preferred	$1,394,808
ST2. Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast	Preferred	$3,667,400
ST3. Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast	Preferred	$1,155,000

[3] The terms "project" and "alternative" are used interchangeably throughout this RP/EA.
[4] FM5/REC7, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass, is jointly proposed and counted under two Restoration Types: Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities. The estimated project costs in Table ES-1 are specific to each Restoration Type.

Reasonable Range of Restoration Alternatives		Estimated Project Costs
ST4. Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast	-	$1,492,700
Restoration Type: Marine Mammals (MM)		
MM1. Florida Gulf Coast Marine Mammal Stranding Network	Preferred	$5,000,000
MM2. Reducing Injury and Mortality to Bottlenose Dolphins in Florida from Illegal Feeding Activities	-	$2,399,300
Restoration Type: Birds (B)		
B1. Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers	Preferred	$1,748,639
B2. Egmont Key Vegetation Management and Dune Retention	Preferred	$466,143
B3. Northeast Florida Coastal Predation Management	Preferred	$449,295
B4. Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years	Preferred	$10,500,000
B5. Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	-	$21,000,000
Restoration Type: Provide and Enhance Recreational Opportunities (REC)		
REC1. Pensacola Community Maritime Park Public Fishing Marina	Preferred	$3,190,502
REC2. Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades	Preferred	$1,402,531
REC3. Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements	Preferred	$353,100
REC4. Gulf Breeze Parks Boating and Fishing Access Upgrades	Preferred	$1,221,660
REC5. Lincoln Park Boat Ramp and Dock Improvements	Preferred	$457,500
FM5/REC6. St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass[4]	Preferred	$2,500,000
REC7. St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass	-	$3,218,988
REC8. Florida Artificial Reef Creation and Restoration – Phase 2	Preferred	$10,342,500
REC9. Apollo Beach Recreational Sportfish Hatchery Facility	Preferred	$4,620,000
Subtotal for Preferred Alternatives		$62,202,078

[a] "Preferred" indicates projects that are preferred for funding by the FL TIG in this RP/EA.

Public Participation in this Draft Restoration Plan 2 and Environmental Assessment

The FL TIG prepared this RP/EA to (1) inform the public about DWH NRDA restoration planning efforts in the Florida Restoration Area, (2) present analyses on the potential restoration benefits and environmental consequences of the reasonable range of restoration alternatives, and (3) seek public comment on this RP/EA.

The public is encouraged to review and comment on this RP/EA during the 30-day comment period following public notice. The deadline for submitting written comments is specified in the public notice published in the *Federal Register* and on the DWH Trustee website (see link below). Comments can be submitted, during the comment period, by one of following methods:

- **Online**: www.gulfspillrestoration.noaa.gov/restoration-areas/florida
- **By mail.** Hard copy addressed to U.S. Fish and Wildlife Service, P.O. Box 29649, Atlanta, GA 30345. In order to be considered, mailed comments must be postmarked on or before the comment deadline.
- **During the public webinar**. See Section 1.8 for details on the webinar.

Please note that personal identifying information included in submitted comments (such as name, address, phone number, and email address) may be made publicly available. Personal information is not required to submit comments.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

ADA	Americans with Disabilities Act of 1990
AL TIG	Alabama Trustee Implementation Group
B	Birds Restoration Type
BGEPA	Bald and Golden Eagle Protection Act of 1940
BMPs	Best management practices
BO	Biological opinion
BP	BP Exploration and Production, Inc.
CE	Categorical exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
DIVER	Data Integration Visualization Exploration and Reporting website
DM	Department manual
DOI	U.S. Department of the Interior
DWH	*Deepwater Horizon*
E&D	Engineering and design, indicates projects that include planning, feasibility, design, engineering, and/or permitting activities only (i.e., not actions related to implementation or construction)
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EKNWR	Egmont Key National Wildlife Refuge
ESA	Endangered Species Act of 1973
FDEP	Florida Department of Environmental Protection
FDEP-FPS	Florida Department of Environmental Protection Florida Park Service
FEMA	Federal Emergency Management Agency
FL TIG	Florida Trustee Implementation Group
FM	Habitat Projects on Federally Managed Lands Restoration Type
FNAI	Florida Natural Area Inventory
FONSI	Finding of no significant impact
FSD	Florida Shorebird Database
FWC	Florida Fish and Wildlife Conservation Commission
GHGs	Greenhouse gases
GMP	General management plan
GUIS	Gulf Islands National Seashore
Gulf	Gulf of Mexico
IPaC	U.S. Fish and Wildlife Service Information for Planning and Consultation
JAXBO	National Marine Fisheries Service Programmatic Biological Opinion on 10 Categories of Minor In-water Activities Occurring in Florida and the U.S. Caribbean; U.S. Army Corps of Engineers Jacksonville District Programmatic Biological Opinion
LA TIG	Louisiana TIG
LED	Light-emitting diode
MAM	Monitoring and Adaptive Management

MDP	Marine Debris Program
MHW	Mean high water
MLW	Mean low water
MM	Marine Mammals Restoration Type
MMSN	Marine Mammal Stranding Network
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NFWF-GEBF	National Fish and Wildlife Foundation Gulf Environmental Benefit Fund
NMFS	National Marine Fisheries Service
NGO	Non-governmental organization
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPS	National Park Service
NRDA	Natural Resource Damage Assessment
O&M	Operations and maintenance
OPA	Oil Pollution Act of 1990
PASO	Public Access Services Office
PDARP/PEIS	Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement
PDC	Project design criteria
PEA	Programmatic Environmental Assessment
PEIS	Programmatic Environmental Impact Statement
REC	Provide and Enhance Recreational Opportunities Restoration Type
RESTORE	Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States
RHA	Rivers and Harbors Act
ROD	Record of Decision
RP/EA	Restoration Plan/Environmental Assessment
RP1/EA	*Deepwater Horizon* Oil Spill Florida Trustee Implementation Group Final Restoration Plan 1 and Environmental Assessment: Habitat Projects on Federally Managed Lands; Nutrient Reduction; Water Quality; and Provide and Enhance Recreational Opportunities
RW TIG	Regionwide Trustee Implementation Group
SAV	Submerged aquatic vegetation
SER	Stock Enhancement Research
ST	Sea Turtles Restoration Type
STSSN	Sea Turtle Stranding and Salvage Network
SVNWR	St. Vincent National Wildlife Refuge
SWFWMD	Southwest Florida Water Management District
TIG	Trustee Implementation Group
Trustees	*Deepwater Horizon* oil spill Natural Resource Damage Assessment Trustees
Trustee SOPs	*Deepwater Horizon* Trustee Council Standard Operating Procedures
UME	Unusual mortality event
USACE	U.S. Army Corps of Engineers
USC	United States Code

USDA	U.S. Department of Agriculture
USDA-APHIS-WS	U.S. Department of Agriculture, Animal Plant Health Inspect Service, Wildlife Service
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

CHAPTER 1 INTRODUCTION, PURPOSE AND NEED, AND PUBLIC PARTICIPATION

1.1 Introduction

The Florida Trustee Implementation Group (FL TIG) has prepared this Draft Restoration Plan 2 and Environmental Assessment (RP/EA) to continue restoration of natural resources and the services they provide that were injured or lost as a result of the *Deepwater Horizon* (DWH) oil spill, inform the public about the DWH Natural Resource Damage Assessment (NRDA) restoration planning efforts, and seek public comment on the identified reasonable range of alternatives for restoration of injured resources. This RP/EA was prepared in accordance with the *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan/Programmatic Environmental Impact Statement (PDARP/PEIS; DWH Trustees 2016a) and the Record of Decision (ROD), the Oil Pollution Act of 1990 (OPA), and the National Environmental Policy Act of 1969 (NEPA).

This RP/EA focuses on a reasonable range of alternatives to restore injured habitats on federally managed lands, sea turtles, marine mammals, birds, and compensate for lost recreational use in the Florida Restoration Area. In this RP/EA, the FL TIG identifies its preferred alternatives to partially compensate the public for injuries caused by the DWH oil spill in the Florida Restoration Area.

1.2 Background and Summary of Settlement

On April 20, 2010, the DWH mobile drilling unit exploded, caught fire, and eventually sank in the Gulf of Mexico (Gulf), resulting in a massive release of oil and other substances from BP Exploration and Production, Inc.'s (BP's) Macondo well. Initial efforts to cap the well were unsuccessful resulting in 87 days of continuous discharge into the northern Gulf, totaling approximately 3.19 million barrels (134 million gallons) of oil (U.S. v. BP et al., 2015). Oil spread from the deep ocean to the surface and nearshore environment from Texas to Florida, coming into contact and injuring a diverse set of natural resources. 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 natural resource services. The breadth of injuries incurred from the incident are described in detail in Chapter 4 of the PDARP/PEIS.

Under the authority of OPA, a council of federal and state trustees (Trustees[5]) was established to assess natural resource injuries resulting from the incident and to work to make the environment and public whole for those injuries. In accordance with OPA NRDA regulations, in February 2016, the Trustees issued a PDARP/PEIS and subsequent ROD detailing a specific proposed plan to fund and implement restoration projects across the Gulf with available restoration funds over a 15-year period. In April 2016, the United States District Court for the Eastern District of Louisiana entered a Consent Decree resolving civil claims by the Trustees against BP arising from the DWH oil spill. The PDARP/PEIS sets forth the process for DWH restoration planning to select specific projects for implementation including outlining programmatic Restoration Goals and Restoration Types (see Figure 5.4-1 of the PDARP/PEIS). The PDARP/PEIS also establishes a distributed governance structure that assigns a TIG for each of eight Restoration Areas.[6] The FL TIG makes all restoration decisions for the funding allocated to the Florida Restoration Area. The FL TIG comprises Trustees from two state and four federal agencies: the Florida Department of Environmental Protection (FDEP) and the Florida Fish and Wildlife Conservation Commission (FWC); the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of the Interior (DOI), U.S. Department of Agriculture (USDA), and U.S. Environmental Protection Agency (USEPA). Chapter 7 of the PDARP/PEIS provides detailed information on the Trustees and the TIG governance structure. The PDARP/PEIS, ROD, and Consent Decree can be found on the DWH Trustee website.[7]

1.3 Restoration Planning by the Florida Trustee Implementation Group

Restoration planning from the DWH oil spill began in Florida on April 20, 2011 as part of the Early Restoration Framework Agreement where BP agreed to provide up to $1 billion toward Early Restoration projects in the Gulf.[8] Thirty-one restoration projects (approximately $128.1 million) are being implemented within the Florida Restoration Area by the FL TIG.[9] Restoration planning continued with the release of one post-settlement restoration plan, the 2019 Final Restoration Plan 1 and Environmental Assessment: Habitat Projects on Federally Managed Lands; Nutrient Reduction; Water Quality; and Provide and Enhance Recreational Opportunities (RP1/EA).[10] Now, the FL TIG is developing this RP/EA as the second restoration plan.

[5] The Trustees are the entities authorized under OPA to act on behalf of the public to assess the natural resource injuries resulting from the DWH oil spill and to develop and implement project-specific restoration plans to compensate for those injuries. Together with the members of the FL TIG, state Trustees authorized by the governors of Florida, Alabama, Mississippi, and Texas compose, as a whole, the Trustees.

[6] Restoration Areas: Unknown Conditions, Regionwide, Open Ocean, Alabama, Florida, Louisiana, Mississippi, and Texas

[7] DWH Trustee website: www.gulfspillrestoration.noaa.gov

[8] The Early Restoration Framework Agreement can be found at www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/2011/05/framework-for-early-restoration-04212011.pdf

[9] Three Early Restoration projects that include activities in Florida, which total $18,352,220, are being implemented by other TIGs: Improving Habitat Injured by Spill Response: Restoring the Night Sky project from Phase II Early Restoration is under the Regionwide TIG, and Gulf Islands National Seashore Beach Enhancement project and Gulf Islands National Seashore Ferry project from Phase III Early Restoration are under the Open Ocean TIG.

[10] The FL TIG RP1/EA can be found at www.gulfspillrestoration.noaa.gov/sites/default/files/2019-03%20FL%20final%20RP%201%20EA_Plan%20only.pdf

In August of 2019, the FL TIG invited the public to submit project ideas for restoration in Florida related to six Restoration Types: Habitat Projects on Federally Managed Lands, Oysters, Sea Turtles, Marine Mammals, Birds, and Provide and Enhance Recreational Opportunities.[11] The FL TIG screened projects in these six Restoration Types and decided not to include Oysters Restoration Type projects in this RP/EA due to existing data gaps that needed to be addressed prior to funding restoration projects. Following the completion of screening, in July 2020, the FL TIG posted a public notice on the DWH Trustee website indicating that the TIG was initiating this RP/EA.[12]

Table 1-1 shows the total FL TIG settlement funds, funds allocated for restoration planning, funds allocated to Early Restoration and RP1/EA projects, and funds proposed for this RP/EA by Restoration Type.[13] The DWH Administrative Record presents more information about project changes adopted by the FL TIG (Section 1.8.1). For the most up-to-date project information, see NOAA's Data Integration Visualization Exploration and Reporting (DIVER) website.[14]

[11] The invitation to submit project ideas can be found at www.gulfspillrestoration.noaa.gov/2019/08/submit-project-ideas-florida-s-next-restoration-plan

[12] The Notice of Intent to begin restoration planning can be found at www.gulfspillrestoration.noaa.gov/2020/07/florida-trustees-initiate-second-restoration-plan

[13] Table 5.10-1 in the PDARP/PEIS provides the allocations to other Restoration Areas.

[14] NOAA's DIVER Explorer for DWH restoration projects can be accessed at www.diver.orr.noaa.gov/

Table 1-1 FL TIG DWH funds by Restoration Goal and underlying Restoration Type

PDARP/PEIS Programmatic Restoration Goal	Restoration Type	Total FL TIG Settlement Funds[15]	Funds Allocated for Restoration Planning	Funds Allocated to Early Restoration Projects	Funds Allocated to RP1/EA Projects	Funds Proposed in this RP/EA
Restore and Conserve Habitat	Wetlands, Coastal and Nearshore Habitats	$20,629,367	--	$15,629,367	--	--
	Habitat Projects on Federally Managed Lands	$17,500,000	$147,296	--	$2,742,451	$13,733,000
Restore Water Quality	Nutrient Reduction	$35,000,000	$34,826	--	$5,250,000	--
	Water Quality	$300,000,000	$125,517	--	$16,945,754	--
Replenish and Protect Living Coastal and Marine Resources	Sea Turtles	$20,000,000	$43,401	--	--	$6,217,208
	Marine Mammals	$5,000,000	$39,315	--	--	$5,000,000
	Birds	$42,835,000	$54,726	$2,835,000	--	$13,164,077
	Oysters	$25,370,596	--	$5,370,596	--	--
Provide and Enhance Recreational Opportunities	Provide and Enhance Recreational Opportunities	$183,817,680	$292,512	$104,155,906	$36,344,535	$24,087,793
	TOTAL	$650,152,643	$737,593	$128,056,740	$61,282,740	$62,202,078

1.4 Oil Pollution Act and National Environmental Policy Act Compliance

As an oil pollution incident, the DWH oil spill is subject to the provisions of OPA (33 United States Code [U.S.C.] § 2701 et seq.). A 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.

Federal trustees must comply with NEPA, 42 U.S.C. § 4321 et seq., its regulations, 40 Code of Federal Regulations (CFR) §§ 1500-1508, and agency-specific NEPA procedures when proposing restoration projects. The NEPA analysis associated with this integrated OPA/NEPA document is being prepared using the 1978 Council on Environmental Quality (CEQ) NEPA Regulations. NEPA analyses initiated prior to September 14, 2020 (the effective date of the revised CEQ regulations) may continue using the 1978 version of the regulations. This environmental assessment began in July, 2020 and the federal Trustees decided to continue under the 1978 regulations.

[15] The total FL TIG settlement funds are $680,152,643, which include the funds by Restoration Goal, $10,000,000 for Monitoring and Adaptive Management, and $20,000,000 for Administrative Oversight and Comprehensive Planning.

The PDARP/PEIS was intended to be used to tier the NEPA analysis in the subsequent restoration plans prepared by the TIGs (40 CFR § 1502.20; see Chapter 6 of the PDARP/PEIS). A tiered environmental analysis is a project-specific analysis that focuses on project-specific issues and summarizes or references (rather than repeats) the broader issues discussed in a programmatic NEPA analysis, in this case the PDARP/PEIS. The NEPA analysis in this RP/EA tiers from the PDARP/PEIS, where applicable. Additionally, the FL TIG relies on incorporation by reference of existing NEPA analyses, management plans, studies, or other relevant material (40 CFR § 1502.21), and adoption of existing NEPA analyses (40 CFR § 1506.3), where applicable, in the analysis of impacts in this RP/EA (Chapter 4).

DOI is the lead federal Trustee for preparing this RP/EA pursuant to NEPA (40 CFR § 1501.5). The other federal and state Trustees of the FL TIG are acting as cooperating agencies for the purposes of compliance with NEPA in the development of this RP/EA (40 CFR §1501.6 and 1508.5). Each federal cooperating agency on the FL TIG intends to adopt the NEPA analysis in this RP/EA. Each will review the analysis for adequacy in meeting the standards set forth in its own NEPA implementing procedures and subsequently adopt the NEPA analysis, if appropriate (40 CFR §1506.3). Adoption of the EA would be completed via signature on the relevant NEPA decision document.

1.5 Restoration Purpose and Need

The FL TIG has undertaken this restoration planning effort to meet the purpose of contributing to the compensation for and restoration of natural resources and their services injured in the Florida Restoration Area as a result of the DWH oil spill. This RP/EA is consistent with the PDARP/PEIS, which identified extensive and complex injuries to natural resources and their services across the Gulf, as well as a need and plan for comprehensive restoration consistent with OPA. This RP/EA falls within the scope of the purpose and need identified in the PDARP/PEIS. As described in Section 5.3 of the PDARP/PEIS, the Restoration Goals (Table 1-1) work independently and together to benefit injured resources and services. The reasonable range of restoration alternatives in this RP/EA address three of the programmatic Restoration Goals: (1) Restore and Conserve Habitat, (2) Replenish and Protect Living Coastal and Marine Resources, and (3) Provide and Enhance Recreational Opportunities. Additional information about the purpose and need for DWH NRDA restoration can be found in Section 5.3.2 of the PDARP/PEIS.

1.6 Proposed Action

The FL TIG proposes to undertake the restoration alternatives identified as preferred in this RP/EA to provide compensatory restoration towards meeting three of the programmatic Restoration Goals identified in the PDARP/PEIS (Section 1.5), and the following Restoration Types: Habitat Projects on Federally Managed Lands, Sea Turtles, Marine Mammals, Birds, and Provide and Enhance Recreational Opportunities.

Table 1-2 identifies the reasonable range of alternatives evaluated in this RP/EA, including those identified as preferred by the FL TIG for implementation. The preferred alternatives would be implemented over approximately the next 3 - 5 years. Figures 1-1 and 1-2 provide the approximate

location of each restoration alternative. The FL TIG proposes to use $62,202,078 of the FL TIG settlement funds plus $39,315 in interest earned on the FL TIG accounts in this RP/EA (i.e., the estimated cost of the preferred restoration alternatives).[16] This would leave a balance of $398,401,730 and any unallocated earned interest remaining for future restoration plans. Detailed information on all alternatives can be found in Section 2.5.

Table 1-2 The reasonable range of restoration alternatives proposed in this RP/EA, by Restoration Type and location (west to east)

Reasonable Range of Restoration Alternatives	
Restoration Type: Habitat Projects on Federally Managed Lands (FM)	
FM1. Johnson Beach Access Management and Habitat Protection	Preferred[a]
FM2. Perdido Key Sediment Placement	Preferred
FM3. Old Fort Pickens Road Utility Line Relocation	-
FM4. Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits	Preferred
FM5/REC6. St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass[b]	Preferred
Restoration Type: Sea Turtles (ST)	
ST1. Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast	Preferred
ST2. Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast	Preferred
ST3. Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast	Preferred
ST4. Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast	-
Restoration Type: Marine Mammals (MM)	
MM1. Florida Gulf Coast Marine Mammal Stranding Network	Preferred
MM2. Reducing Injury and Mortality to Bottlenose Dolphins in Florida from Illegal Feeding Activities	-
Restoration Type: Birds (B)	
B1. Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers	Preferred
B2. Egmont Key Vegetation Management and Dune Retention	Preferred
B3. Northeast Florida Coastal Predation Management	Preferred
B4. Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years	Preferred
B5. Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	-
Restoration Type: Provide and Enhance Recreational Opportunities (REC)	
REC1. Pensacola Community Maritime Park Public Fishing Marina	Preferred
REC2. Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades	Preferred
REC3. Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements	Preferred

[16] Each alternative's estimated costs are provided in Chapter 2.

Reasonable Range of Restoration Alternatives	
REC4. Gulf Breeze Parks Boating and Fishing Access Upgrades	Preferred
REC5. Lincoln Park Boat Ramp and Dock Improvements	Preferred
FM5/REC6. St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass[b]	Preferred
REC7. St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass	-
REC8. Florida Artificial Reef Creation and Restoration – Phase 2	Preferred
REC9. Apollo Beach Recreational Sportfish Hatchery Facility	Preferred

[a] "Preferred" indicates projects that are preferred for funding by the FL TIG in this RP/EA.
[b] This project is jointly proposed under two Restoration Types: Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities.
[c] E&D indicates projects that include planning, feasibility, design, engineering, and/or permitting activities only (i.e., no activities related to implementation or construction).

Figure 1-1 Approximate location of the site-specific reasonable range of alternatives proposed in this RP/EA

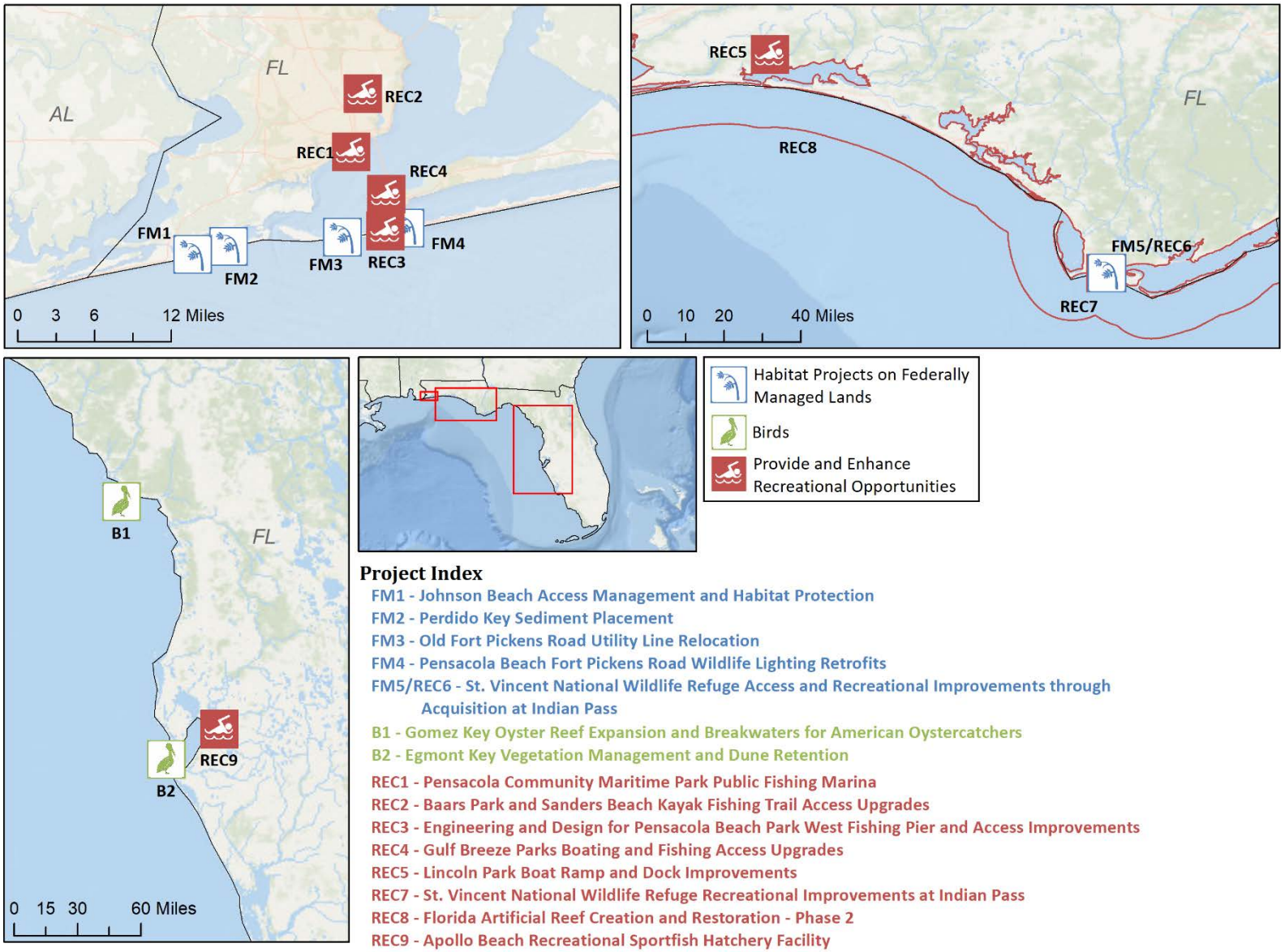


Figure 1-2 Approximate location of the Florida Gulf-wide and Atlantic Coast reasonable range of alternatives proposed in this RP/EA

1.6.1 No Action

Under the Natural Recovery/No Action Alternative, the FL TIG would not select and implement any of the restoration alternatives proposed in this RP/EA. In the PDARP/PEIS, the Trustees analyzed the Natural Recovery/No Action Alternative programmatically (Section 3.7) and found that it would not meet the purpose and need for restoring lost natural resources and their services. A No Action Alternative is included in the RP/EA analysis pursuant to NEPA as a "… benchmark, enabling decisionmakers to compare the magnitude of environmental effects of the action alternatives."[17] The No Action alternative is analyzed for each Restoration Type in Chapter 4 of this RP/EA.

1.6.2 Severability of Projects

Preferred restoration alternatives identified in this RP/EA are independent of each other and may be selected independently by the FL TIG. A decision not to select one or more of the alternatives does not affect the FL TIG's selection of any remaining alternatives.

1.7 Coordination with Other Gulf Restoration Programs

As discussed in Section 1.5.6 of the PDARP/PEIS, coordination with other Gulf restoration programs would promote successful implementation of restoration projects and optimize ecosystem recovery. The FL TIG is committed to coordinating with other DWH oil spill and Gulf restoration programs (e.g., the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States [RESTORE] Act, the National Fish and Wildlife Foundation's Gulf Environmental Benefit Fund [NFWF-GEBF]) to maximize the overall ecosystem impact of restoration efforts and ensure effective use of funds by identifying synergies and reducing potential redundancies in project selection. This coordination would ensure that funds are allocated for critical restoration projects across the Gulf and specifically within Florida.

For example, the FL TIG is coordinating efforts conducted across multiple funding sources to reduce artificial light and improve habitat along the Florida coast. The FL TIG RP1/EA Gulf Islands National Seashore (Florida) Night Sky Restoration (Planning and Design) project built on work completed through the DWH NRDA Improving Habitat Injured by Spill Response: Restoring the Night Sky and the NFWF-GEBF Eliminating Light Pollution at Sea Turtle Nesting Beaches (Phase II) projects. The proposed FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits project in this RP/EA (Section 2.5.1) would continue to build on these efforts and improve additional coastal habitat in Gulf Islands National Seashore (GUIS) by retrofitting streetlights along Fort Pickens Road. These retrofits would benefit sea turtle nesting habitat by reducing light trespass and sea turtle nesting disorientation.

In addition to coordination across funding sources, the FL TIG is committed to effective collaboration with other states and agencies to maximize resource benefits and ensure effective use of NRDA funds. For example, the FL TIG leveraged funds through an FWC Boating and Waterways match grant and coordinated with Alabama on recreational enhancements in the Perdido River. The RP1/EA Perdido River and Bay Paddle Trail project includes recreational enhancements at multiple locations along the

[17] CEQ. 03/23/81. Council on Environmental Quality - Forty Most Asked Questions Concerning CEQ's NEPA Regulations.

Florida side of the Perdido River such as shelters and parking. This work complements the Perdido River public boat ramp completed as part of the DWH NRDA Florida Boat Ramp Enhancement and Construction project, The Nature Conservancy's Perdido Blueway Trail and Watershed Protection project, as well as the paddling trail and amenities the Alabama TIG (AL TIG) would develop through their Perdido River Land Acquisition (Molpus Tract) project.

NRDA, RESTORE, and NFWF-GEBF projects currently funded within Florida are described on the DWH Trustee, Florida DWH, NFWF-GEBF, and RESTORE websites.[18] Restoration alternatives evaluated in this RP/EA that leverage funds from RESTORE or NFWF-GEBF are identified within the project descriptions in Section 2.5.

1.8 Public Participation

On August 20, 2019, the FL TIG posted a public invitation on the DWH Trustee website (see link below) to submit project ideas for restoration in Florida related to six Restoration Types: Habitat Projects on Federally Managed Lands, Oysters, Sea Turtles, Marine Mammals, Birds, and Provide and Enhance Recreational Opportunities.[19] Over 2,160 submissions were received and screened.

On July 29, 2020, the TIG posted a public notice on the DWH Trustee website indicating that the TIG was initiating this RP/EA.[20] The public is encouraged to review and comment on this RP/EA during the 30-day comment period following public notice of availability (NOA). Comments can be submitted during the comment period by one of the following methods:

Online: www.gulfspillrestoration.noaa.gov/restoration-areas/florida

By mail. Hard copy addressed to U.S. Fish and Wildlife Service, P.O. Box 29649, Atlanta, GA 30345.

In order to be considered, mailed comments must be postmarked on or before the comment deadline specified in the *Federal Register* and on the DWH Trustee website.

During the public webinar: The FL TIG will hold a public webinar to facilitate the public review and comment process. A weblink for the public webinar can be found in this webstory on the DWH Trustee website. Webinar date and time are as follows:

- Thursday, March 11, 2021 from 5:00 – 6:00 PM Eastern Time

After the close of the comment period, the FL TIG will consider all comments received and revise the RP/EA, as appropriate. A summary of comments received and the FL TIG's responses where applicable, will be included in the final RP/EA.

[18] Website links: DWH Trustee: www.gulfspillrestoration.noaa.gov/restoration-areas/florida; Florida DWH: www.deepwaterhorizonflorida.com; NFWF-GEBF: www.nfwf.org/gulf/Pages/GEBF-Florida.aspx; RESTORE: www.restorethegulf.gov/.

[19] The invitation to submit project ideas can be found at www.gulfspillrestoration.noaa.gov/2019/08/submit-project-ideas-florida-s-next-restoration-plan

[20] The Notice of Intent to begin restoration planning can be found at www.gulfspillrestoration.noaa.gov/2020/07/florida-trustees-initiate-second-restoration-plan

Please note that personal identifying information included in submitted comments (such as name, address, phone number, and email address) may be made publicly available. Personal information is not required to submit comments.

1.8.1 Administrative Record

The Trustees opened a publicly available Administrative Record for the DWH oil spill NRDA,[21] including restoration planning activities, concurrently with publication of the 2010 Notice of Intent (NOI; pursuant to 15 CFR § 990.45). DOI is the lead federal Trustee for maintaining the Administrative Record.

Information about restoration project implementation is being provided to the public through the Administrative Record and other outreach efforts (Section 1.8), including the DWH Trustee and the Florida DWH websites.

1.9 Decisions to be Made

This RP/EA is intended to provide the public and decision makers with information and analysis on the FL TIG's proposal to implement the proposed action described in this RP/EA, which includes restoration alternatives to restore habitats on federally managed lands, sea turtles, marine mammals, birds, and provide and enhance recreational opportunities. To help inform the TIG's decision on which alternatives to implement, the environmental impacts of the alternatives are assessed in Chapter 4 of this document. This RP/EA, together with public review and comment, is intended to guide the TIG's selection of projects for implementation that best meet the purpose and need as described in Section 1.5 above.

[21] The DWH Administrative Record can be found at www.doi.gov/deepwaterhorizon/adminrecord.

CHAPTER 2 RESTORATION PLANNING PROCESS AND REASONABLE RANGE OF ALTERNATIVES

NRDA restoration under OPA is a process that includes evaluating injuries to natural resources and their services to determine the type and extent of restoration needed to address those injuries. Restoration activities need to produce benefits that are related to or have a nexus (connection) to the natural resources or their services impacted by an oil spill. This chapter describes the screening process used by the FL TIG to identify the reasonable range of alternatives in this RP/EA as provided in the OPA NRDA regulations (15 CFR § 990.53). The reasonable range of alternatives is consistent with the PDARP/PEIS (described in more detail in Chapter 1). This chapter summarizes the restoration decisions stated in the PDARP/PEIS ROD[22], the relationship of the PDARP/PEIS to this RP/EA, injuries addressed, the screening process used by the FL TIG to identify the reasonable range of alternatives, and the projects considered in the reasonable range of alternatives. The restoration planning process was conducted in accordance with OPA NRDA regulations (15 CFR § 990.53), NEPA implementing regulations (40 CFR §§ 1500-1508), the Consent Decree, and the Trustee Council's Standard Operating Procedures (SOPs).

2.1 PDARP/PEIS and Record of Decision

Given the potential magnitude and breadth of restoration for DWH oil spill injuries, the Trustees prepared a PDARP/PEIS under OPA and NEPA. The PDARP/PEIS was released on February 19, 2016 and detailed a programmatic plan to fund and implement restoration projects across the Gulf. Specifically, the PDARP/PEIS provides a description of the Trustees' nested framework for restoration which includes the programmatic Restoration Goals, Restoration Types (i.e., broad categories of restoration such as "sea turtles" or "birds") that fall under each programmatic goal, Restoration Approaches (i.e., options for conducting restoration such as create, restore, and enhance coastal wetlands or restore and conserve bird nesting and foraging habitat) under each Restoration Type, and restoration techniques (i.e., specific restoration methods) under each Restoration Approach. In the PDARP/PEIS, the Trustees analyzed alternative Restoration Approaches. The Trustees also established targeted goals specific to each Restoration Type to guide restoration planning.

On March 29, 2016, in accordance with OPA and NEPA, the Trustees published a NOA of a ROD for the PDARP/PEIS in the *Federal Register* (81 FR 17438). Based on the injury determination established in the PDARP/PEIS, the ROD set forth the basis for the Trustees' decision to select Alternative A: Comprehensive Integrated Ecosystem Alternative and its associated funding allocations. More information about Alternative A can be found in Sections 5.5 and 5.10 of the PDARP/PEIS. Summary

[22] The PDARP/PEIS and ROD can be found at www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan/

information about the relationship between the PDARP/PEIS and this document can be found in Section 2.2 below.

2.2 Relationship of this RP/EA to the PDARP/PEIS

As a programmatic restoration plan, the PDARP/PEIS provides direction and guidance for identifying, evaluating, and selecting restoration projects to be implemented by the TIGs (Section 5.10.4 and Chapter 7 of the PDARP/PEIS). As the PDARP/PEIS analysis shows, the injuries caused by the DWH oil spill cannot be fully described at the level of a single species, habitat type, or region. Therefore, there is a need for comprehensive restoration planning on a landscape and ecosystem scale that recognizes and strengthens existing connectivity among habitats, resources, and their services in the Gulf, as illustrated in Alternative A. The Trustees prepared a PEIS to analyze the environmental impacts of the reasonable range of programmatic alternatives, to consider the multiple related actions that could occur because of restoration planning efforts, and to allow for a better analysis of cumulative impacts of potential actions.

As noted above, in the PDARP/PEIS, the Trustees developed a set of Restoration Goals and Types for inclusion in programmatic alternatives with an objective to seek a diverse set of projects providing benefits to a broad array of injured resources and their services. This process resulted in the inclusion of 13 Restoration Types across four programmatic Restoration Goals. In addition, a fifth Restoration Goal, for MAM and Administrative Oversight and Comprehensive Planning to support restoration implementation, supports each Restoration Type and informs overall decision-making (see Figure 5.4-1 in the PDARP/PEIS). The Consent Decree and PDARP/PEIS allocated funding to the Florida Restoration Area for nine of the 13 Restoration Types and the MAM/Administrative Restoration Goal (Table 1-1; Table 2-1).[23]

[23] Table 5.10-1 in the PDARP/PEIS provides the allocations to other Restoration Areas.

Table 2-1 FL TIG DWH funds by Restoration Goal and underlying Restoration Type

PDARP/PEIS Programmatic Restoration Goal	Restoration Type	Total FL TIG Settlement Funds[24]	Funds Allocated for Restoration Planning	Funds Allocated to Early Restoration Projects	Funds Allocated to RP1/EA Projects	Funds Proposed in this RP/EA
Restore and Conserve Habitat	Wetlands, Coastal and Nearshore Habitats	$20,629,367	--	$15,629,367	--	--
	Habitat Projects on Federally Managed Lands	$17,500,000	$147,296	--	$2,742,451	$13,733,000
Restore Water Quality	Nutrient Reduction	$35,000,000	$34,826	--	$5,250,000	--
	Water Quality	$300,000,000	$125,517	--	$16,945,754	--
Replenish and Protect Living Coastal and Marine Resources	Sea Turtles	$20,000,000	$43,401	--	--	$6,217,208
	Marine Mammals	$5,000,000	$39,315	--	--	$5,000,000
	Birds	$42,835,000	$54,726	$2,835,000	--	$13,164,077
	Oysters	$25,370,596	--	$5,370,596	--	--
Provide and Enhance Recreational Opportunities	Provide and Enhance Recreational Opportunities	$183,817,680	$292,512	$104,155,906	$36,344,535	$24,087,793
	TOTAL	$650,152,643	$737,593	$128,056,740	$61,282,740	$62,202,078

The reasonable range of alternatives included in this RP/EA (Table 1-2) is consistent with the following Restoration Types: Habitat Projects on Federally Managed Lands (Section 5.5.3 of the PDARP/PEIS), Sea Turtles (Section 5.5.10 of the PDARP/PEIS), Marine Mammals (Section 5.5.11 of the PDARP/PEIS), Birds (Section 5.5.12 of the PDARP/PEIS), and Provide and Enhance Recreational Opportunities (Section 5.5.14 of the PDARP/PEIS).

2.3 Summary of Injuries Addressed in this RP/EA

Chapter 4 of the PDARP/PEIS summarizes the injury assessment, which documented the nature, degree, and extent of injuries from the DWH oil spill to both natural resources and their services. The reasonable range of alternatives identified in this RP/EA and in future FL TIG restoration plans is designed to address injuries in the Florida Restoration Area. This RP/EA identifies alternatives for the following Restoration Types: Habitat Projects on Federally Managed Lands, Sea Turtles, Marine Mammals, Birds, and Provide and Enhance Recreational Opportunities. This section summarizes the most relevant information from

[24] The total FL TIG settlement funds are $680,152,643, which include the funds by Restoration Goal, $10,000,000 for Monitoring and Adaptive Management, and $20,000,000 for Administrative Oversight and Comprehensive Planning.

Chapter 4 of the PDARP/PEIS injury assessment and establishes the nexus for restoration planning for these Restoration Types.

2.3.1 Habitat Projects on Federally Managed Lands

The DWH oil spill and response activities caused extensive injuries to wetlands, coastal, and nearshore habitats on federally managed lands across the northern Gulf. In Florida, the spill oiled 1,801 acres along 80 miles of federally managed beach shoreline (DOI lands in Florida, Table 4.6-18, page 4-397 in the PDARP/PEIS). Injuries from oiling and response-related activities occurred within St. Vincent National Wildlife Refuge (SVNWR) and the Florida units of the GUIS, specifically to critical beach and dune habitat.

Habitat injuries on federally managed lands in the Florida Restoration Area have been partially addressed through projects approved in the FL TIG's RP1/EA (Table 2-1).

2.3.2 Sea Turtles

All five species of sea turtles that inhabit the Gulf (loggerhead, Kemp's ridley, green, leatherback, and hawksbill) are listed as threatened or endangered under the Endangered Species Act of 1973 (ESA), are long-lived, travel widely, and use a variety of habitats across the Gulf and beyond.

Sea turtles were injured by oil or response activities in open ocean, nearshore, and shoreline environments, and the resulting mortality spanned multiple life stages. The Trustees estimated that between 4,900 and up to 7,600 large juvenile and adult sea turtles (Kemp's ridleys, loggerheads, and hard-shelled sea turtles not identified by species) and between 56,000 and up to 166,000 small juvenile sea turtles (Kemp's ridleys, green turtles, loggerheads, hawksbills, and hard-shelled sea turtles not identified by species) were killed by the DWH oil spill. Nearly 35,000 hatchling sea turtles (loggerheads, Kemp's ridleys, and green turtles) were injured by response activities, and thousands more Kemp's ridley and loggerhead hatchlings were lost because of unrealized reproduction by adult sea turtles that were killed by the DWH oil spill. In addition, leatherback turtles were determined to have been injured, but this injury could not be quantified (DWH Trustees 2017c).

In Florida, injuries resulted from both oiling and response activities along sea turtle nesting beaches. The Trustees evaluated nest losses on Florida Panhandle beaches due to response activities (Cacela & Dixon 2013; Frater 2015) and confirmed a significant decrease of approximately 250 loggerhead nests in 2010. The Trustees concluded that this decrease in nest density was related to oil cleanup operations that deterred adult female loggerheads from coming ashore and laying their eggs. This estimated loss equates to approximately 18,000 unrealized hatchlings from Florida Panhandle nesting beaches in 2010 (Cacela & Dixon 2013).

In addition, nests from three species—loggerheads, Kemp's ridleys, and green sea turtles—were excavated prior to hatchling emergence, and eggs were translocated from Florida and Alabama beaches to a protected hatchery on the Atlantic coast of Florida. A total of 28,681 eggs from 274 nests in Alabama and Florida (16 nests from Alabama and 258 nests from Florida) were translocated, and 14,796 hatchling turtles emerged and were released into the Atlantic Ocean. Because these hatchlings entered

the Atlantic Ocean and are believed unlikely to return to the Gulf, the assessment assumes these hatchlings were lost to the Gulf breeding population because of the spill.

2.3.3 Marine Mammals

The Trustees demonstrated spill-related effects to a vast number of marine mammal species across a wide geographic range. Contamination of habitat in the nearshore and offshore waters of the northern Gulf resulted in marine mammals inhaling, ingesting, aspirating, and possibly absorbing oil. As a result, thousands of animals suffered physical injury and toxic effects to organs and tissues, including lung disease, adrenal disease, poor body condition, and other adverse health effects. Animals that experienced these adverse health effects contributed to the largest and longest marine mammal unusual mortality event (UME) on record in the Gulf. Bottlenose dolphins were the most impacted species in this UME, and dead, stranded individuals included near-term fetuses from failed pregnancies. Moreover, marine mammal populations that overlap with the footprint of the DWH oil spill still have demonstrable, quantifiable injuries. Because cetaceans are long-lived animals, give birth to only one calf every few years, and are slow to reach reproductive maturity, injured marine mammal stocks would take many decades to recover without active restoration (DWH Trustees 2017b).

2.3.4 Birds

At least 93 species of birds, including both resident and migratory species across all five Gulf Coast states, were exposed to DWH oil in multiple northern Gulf habitats, including open water, islands, beaches, bays, and marshes. Laboratory studies showed that exposure to DWH oil led to injuries, including feather damage, abnormal blood attributes, organ damage, and death.

The Trustees estimated that between 51,600 and 84,500 birds died because of the DWH oil spill. Of those quantified dead birds, breeding-age adults would have produced an estimated 4,600 to 17,900 fledglings. The Trustees recognize that additional injury occurred that is unquantified; true bird mortality is likely closer to the upper ranges than the lower (PDARP/PEIS, Section 4.7.5).

Although the precise number of birds injured and killed in the Florida Restoration Area was difficult to quantify during the assessment, impacts did occur as a result of exposure to oil and from the effects of response activities.

Bird injury in the Florida Restoration Area has been partially addressed through Early Restoration projects (Table 2-1).

2.3.5 Provide and Enhance Recreational Opportunities

The Gulf is a popular destination for locals and tourists to participate in a wide variety of recreational activities, drawing people regionally as well as nationally. These activities, including boating, fishing, and beach-going, depend on the environmental quality of the Gulf's natural resources and the ability to access them. The DWH oil spill resulted in losses to the public's use of natural resources for outdoor recreation from May 2010 through November 2011. The Trustees estimated that more than 16 million

boating, fishing, and other shoreline activity user-days[25] were lost across the five affected Gulf states. Total recreational use injuries attributable to the DWH oil spill are estimated at $693.2 million (with an uncertainty range of from $527.6 million to $858.9 million). The PDARP/PEIS indicates that recreational uses have recovered. The purpose of the recreational use alternatives in this RP/EA is to provide compensatory restoration for losses that occurred between April 2010 and November 2011, after which recreational use returned to baseline levels.

Recreational use injury in the Florida Restoration Area has been partially addressed through Early Restoration projects, and through the projects approved in the FL TIG's RP1/EA (Table 2-1).

2.4 Screening for a Reasonable Range of Alternatives for this RP/EA

In developing a reasonable range of alternatives for this RP/EA, the FL TIG reviewed the Restoration Goals, Types, Approaches, and techniques described in the PDARP/PEIS. The FL TIG also considered other criteria identified in the PDARP/PEIS, including the six evaluation standards from the OPA NRDA regulations (15 CFR § 990.54), input from the public, the current and future availability of funds under the DWH NRDA settlement payment schedule, as well as projects already funded or proposed to be funded by other TIGs (e.g., Regionwide TIG [RW TIG]) or DWH funding sources (e.g., NFWF-GEBF, RESTORE). A summary of the OPA evaluation criteria is provided in Section 3.1. The FL TIG's screening process is described in Sections 2.4.1 through 2.4.5.

2.4.1 Identification of Restoration Alternatives and Eligibility Screening

On August 20, 2019, the FL TIG invited the public to submit project ideas related to the following Restoration Types: Habitat Projects on Federally Managed Lands, Sea Turtles, Marine Mammals, Birds, and Provide and Enhance Recreational Opportunities.[26] The FL TIG screened projects that existed or were submitted to either the DWH Trustee project portal[27] or the Florida project portal[28] by September 20, 2019. Consistent with Section 9.4.1.4 of the Trustee Council's SOPs, the FL TIG also considered project ideas developed by FL TIG Trustees and project ideas from Gulf restoration reports, management plans, or related efforts. The FL TIG also considered projects that pertained to multiple Restoration Types or that could be implemented in phases.

- **Habitat Projects on Federally Managed Lands**: projects that focus on the habitats that were injured on lands managed by federal agencies, which in Florida includes restoration of dunes and beaches at GUIS and SVNWR.
- **Sea Turtles**: projects that address the key threats to sea turtles and emphasize activities that are consistent with their recovery plans. The FL TIG requested projects that specifically addressed the following:

[25] The Trustees define a 'user-day' as any time an individual visits a beach, goes fishing, or goes boating for the purpose of recreation for at least part of the day.

[26] The invitation to submit project ideas can be found at www.gulfspillrestoration.noaa.gov/2019/08/submit-project-ideas-florida-s-next-restoration-plan. Initial screening efforts included projects in the Oyster Restoration Type, however, the FL TIG decided not to include Oyster Restoration Type projects in this RP/EA.

[27] DWH Trustee website: www.gulfspillrestoration.noaa.gov

[28] Florida DWH website: www.deepwaterhorizonflorida.com

    - Florida Panhandle (from Escambia to Franklin County): reducing beachfront lighting by implementing programs and coordinating with local municipalities to minimize artificial lighting visible from the nesting beach; or,
    - Statewide: removing abandoned or derelict fishing gear or other permanent/semi-permanent materials that create an entanglement or entrapment risk to sea turtles or that act as barriers to sea turtle nesting; evaluating, developing, and implementing conservation measures to reduce sea turtle bycatch in pier- and shore-based recreational fisheries; conducting activities that minimize sea turtle vessel strikes in areas of critical importance for sea turtles and areas previously identified as vessel strike hotspots; or, characterizing the scale and potential impacts of commercial and recreational fisheries in Florida relative to sea turtle bycatch.
- **Marine Mammals**: projects that address stressors that cause mortality (death) and morbidity (illness that reduces fitness) to marine mammal stocks. The FL TIG requested projects that specifically addressed the following:
    - Reducing lethal and harmful impacts on dolphins from hook-and-line fishing activities and related mortalities from retaliation;
    - Addressing gaps and enhance capacity in the current capabilities of the Marine Mammal Stranding Network (MMSN) throughout the Gulf to improve timeliness of response and diagnosis of illness and cause of death, improve the ability of stranding network partners to detect and rescue free-swimming marine mammals that are entangled, entrapped, or out of habitat; or,
    - Reducing lethal and harmful impacts on dolphins from illegal feeding activities by effectively changing human behaviors.
- **Birds**: projects that enhance bird reproductive success and survival. The FL TIG requested projects that specifically addressed the following:
    - Shorebirds: nesting and foraging area stewardship;
    - American oystercatchers: create or enhance intertidal oyster shell rakes and beds; or,
    - Pelicans/wading birds: enhance habitat through vegetation management, nesting and foraging area stewardship, provide or enhance artificial nest sites, create or enhance coastal wetlands through placement of dredged material, restore or construct barrier and coastal islands and headlands via placement of dredged sediments, acquire lands for conservation, develop and implement management actions in conservation areas and/or restoration projects, translocate chicks and/or attracting breeding adults to restoration sites.
- **Provide and Enhance Recreational Opportunities**: provides recreational opportunities through infrastructure, access, and education. The FL TIG requested projects that specifically addressed enhancing recreational fishing opportunities.

In late 2019, the FL TIG compiled all of the project ideas from the Florida portal and the DWH Trustee portal, specifically those that identified Florida, Gulf-wide, Regionwide, or Caribbean-wide for geographic location or left the geographic location field blank into one project spreadsheet. This combined spreadsheet included a total of 2,162 projects, half of which were not relevant to the

Restoration Types requested in the call for project ideas. As such, the FL TIG used a series of key words to identify projects related to each Restoration Type from the call for project ideas (e.g., "Gulf Islands", "Vincent" for Habitat Projects of Federally Managed Lands, "shorebirds", "American oystercatcher" for Birds) and binned the projects into one or more Restoration Types. The FL TIG excluded projects that would not directly benefit the resources addressed by each Restoration Type included in this RP/EA (e.g., development of general ecological management plans, staffing for ecological programs), projects that were already being implemented by a TIG, or projects that had been approved in a previous restoration plan and later cancelled.

This resulted in a total of 1,005 projects including: 34 Habitat Projects on Federally Managed Lands, 221 Sea Turtles, 118 Marine Mammals, 261 Birds, and 371 Provide and Enhance Recreational Opportunities projects (Figure 2-1).[29]

2.4.2 Primary Screening

In April/May of 2020, the FL TIG completed Step 1, primary screening of the 1,005 projects. Projects that did not address the Restoration Approaches and techniques (where specified) in the call for projects were screened out. The FL TIG then evaluated the remaining projects and selected exemplar projects[30] for each of the restoration techniques. This step resulted in a total of 82 projects (5 Habitat Projects on Federally Managed Lands, 22 Sea Turtles, 9 Marine Mammals, 23 Birds, and 23 Provide and Enhance Recreational Opportunities projects; Figure 2-1).

2.4.3 Secondary Screening

In May/June of 2020, the FL TIG completed Step 2, secondary screening of the 82 projects. Small teams were formed for each Restoration Type, which included Trustees and subject matter experts to evaluate each exemplar project and identify projects or components of projects for final screening and project development. The small teams considered the expected restoration benefits of each project, feasibility, available funding sources, potential leveraging opportunities, timing of future restoration plans, and the Trustees' procurement processes. During this step, the DOI FL TIG Trustees introduced a new project under the Habitat Projects on Federally Managed Lands Restoration Type that was subsequently expanded to include a component under the Provide and Enhance Recreational Opportunities Restoration Type. The FWC FL TIG Trustee also introduced a new project under the Provide and Enhance Recreational Opportunities Restoration Type. This step resulted in a total of 31 projects (6 Habitat Projects on Federally Managed Lands, 6 Sea Turtles, 4 Marine Mammals, 6 Birds, and 9 Provide and Enhance Recreational Opportunities projects; Figure 2-1).

2.4.4 Final Screening

In June/July of 2020, the FL TIG completed final screening efforts, including further developing the remaining 31 projects. Through this project development process, a sea turtle project was identified as a data gap project (i.e., a project that needs to be completed prior to on-the-ground restoration work to inform future restoration efforts) and was removed from consideration in this RP/EA. In addition, some

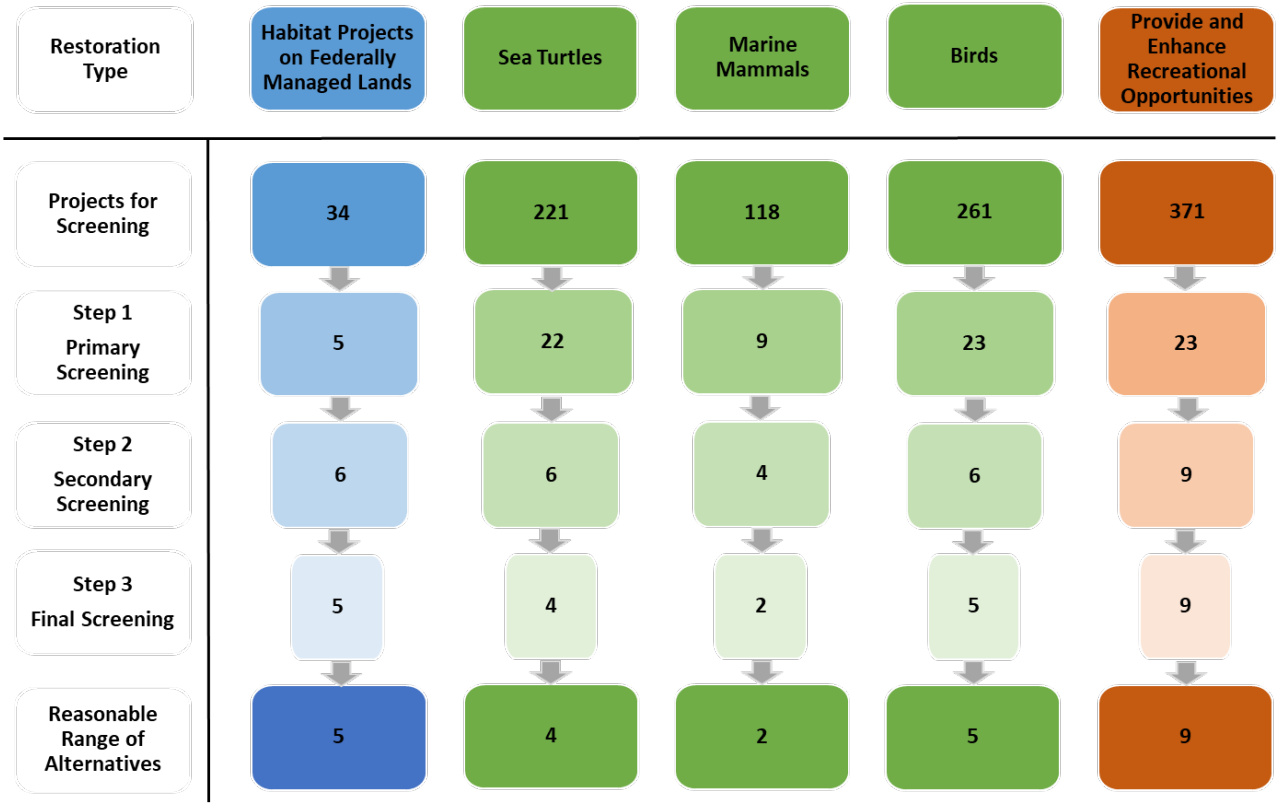
[29] Some projects indicated multiple resource benefits and were binned under multiple Restoration Types.
[30] Exemplar projects were those projects identified, in the judgement of the FL TIG, as the best model for implementing specified restoration techniques and achieving direct restoration benefits for resources injured by the DWH oil spill.

projects, or components of projects, were combined to create new projects. Overall, this step resulted in 24 projects that are included in the reasonable range of alternatives for evaluation in this RP/EA (Figure 2-1; Section 2.5).

2.4.5 Alternatives not Considered for Further Evaluation in this RP/EA

The FL TIG's decisions to advance projects to the reasonable range of alternatives are based on balancing the considerations outlined above and the context of the full suite of restoration alternatives being advanced for analysis in this RP/EA. The screening process identified the potential to propose a project for marine mammals relating to the hook-and-line fishery, however, that type of project was not evaluated further in this RP/EA while the Trustees considered whether this type of action is better pursued at a regional scale. As a result, while a project considered in the secondary screening step may have received a generally favorable review, the FL TIG may still have decided not to advance it to the reasonable range of alternatives for this RP/EA. 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 RP/EA.

Figure 2-1 **The FL TIG screening process to develop the reasonable range of alternatives included in this RP/EA[31]**



2.5 Reasonable Range of Alternatives

Based on the screening process described in Section 2.4, the FL TIG identified a reasonable range of alternatives for further evaluation in this RP/EA (Table 2-2). The alternatives considered in this RP/EA are consistent with five of the Restoration Types from the PDARP/PEIS, as follows:

- Habitat Projects on Federally Managed Lands: five alternatives[31] (Section 2.5.1);
- Sea Turtles: four alternatives (Section 2.5.2);
- Marine Mammals: two alternatives (Section 2.5.3)
- Birds: five alternatives (Section 2.5.4); and
- Provide and Enhance Recreational Opportunities: nine alternatives[31] (Section 2.5.5).

One of the Provide and Enhance Recreational Opportunities alternatives only includes planning, feasibility, design, engineering, and permitting activities (hereafter identified as an "E&D" project). This is being proposed as a preliminary planning phase of a conceptual project to allow the FL TIG to conduct a range of activities that would provide information necessary to consider a subsequent implementation phase in a future restoration plan. The remaining 23 alternatives would include implementation actions after all regulatory compliance and permitting requirements are met.

[31] One alternative is jointly proposed and listed under two Restoration Types: Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities.

Table 2-2 The reasonable range of restoration alternatives proposed in this RP/EA, by Restoration Type and location (west to east)

Reasonable Range of Restoration Alternatives	Estimated Project Costs
Restoration Type: Habitat Projects on Federally Managed Lands (FM)	
FM1. Johnson Beach Access Management and Habitat Protection	$3,200,000
FM2. Perdido Key Sediment Placement	$6,773,000
FM3. Old Fort Pickens Road Utility Line Relocation	$1,249,930
FM4. Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits	$540,000
FM5/REC6. St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass[a]	$3,220,000
Restoration Type: Sea Turtles (ST)	
ST1. Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast	$1,394,808
ST2. Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast	$3,667,400
ST3. Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast	$1,155,000
ST4. Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast	$1,492,700
Restoration Type: Marine Mammals (MM)	
MM1. Florida Gulf Coast Marine Mammal Stranding Network	$5,000,000
MM2. Reducing Injury and Mortality to Bottlenose Dolphins in Florida from Illegal Feeding Activities	$2,399,300
Restoration Type: Birds (B)	
B1. Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers	$1,748,639
B2. Egmont Key Vegetation Management and Dune Retention	$466,143
B3. Northeast Florida Coastal Predation Management	$449,295
B4. Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years	$10,500,000
B5. Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	$21,000,000
Restoration Type: Provide and Enhance Recreational Opportunities (REC)	
REC1. Pensacola Community Maritime Park Public Fishing Marina	$3,190,502
REC2. Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades	$1,402,531
REC3. Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements	$353,100
REC4. Gulf Breeze Parks Boating and Fishing Access Upgrades	$1,221,660
REC5. Lincoln Park Boat Ramp and Dock Improvements	$457,500
FM5/REC6. St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass[a]	$2,500,000
REC7. St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass	$3,218,988
REC8. Florida Artificial Reef Creation and Restoration – Phase 2	$10,342,500

Reasonable Range of Restoration Alternatives	Estimated Project Costs
REC9. Apollo Beach Recreational Sportfish Hatchery Facility	$4,620,000
[a] This project is jointly proposed and counted under two Restoration Types: Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities. The estimated project costs are specific to each Restoration Type.	

Sections 2.5.1-2.5.5 include project descriptions for each restoration alternative by Restoration Type. Each project description identifies the PDARP/PEIS Restoration Type-specific Restoration Approach and technique associated with the project, the project location, a summary of the project, details related to specific activities and implementation, a summary of maintenance activities and project monitoring, and the estimated project costs.

2.5.1 Project Descriptions: Habitat Projects on Federally Managed Lands

This RP/EA identifies five restoration alternatives consistent with the Restore and Conserve Habitat Restoration Goal (PDARP/PEIS Section 5.3.1) and underlying Habitat Projects on Federally Managed Lands Restoration Type (PDARP/PEIS Section 5.5.3):

1. Johnson Beach Access Management and Habitat Protection (preferred);
2. Perdido Key Sediment Placement (preferred);
3. Old Fort Pickens Road Utility Line Relocation;
4. Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits (preferred); and
5. St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred).[32]

A description of each of these restoration alternatives is provided below.

[32] This project is jointly proposed and described under two Restoration Types: Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities.

FM1, Johnson Beach Access Management and Habitat Protection (preferred)

Restoration Approach

Restore and enhance dunes and beaches (PDARP/PEIS Section 5.5.3.2)

Restoration Technique

Protect dune systems through the use of access control (PDARP/PEIS Appendix 5.D.1.5)

Project Location

Westernmost 2 miles of Perdido Key Unit, GUIS, Escambia County (Figure 2-2)

Project Summary

This project would be implemented by the DOI FL TIG Trustee in coordination with the National Park Service (NPS) and GUIS staff. The project would improve the habitat of the 2-mile stretch of barrier island along Johnson Beach Road by managing visitor access to the north and south shorelines of the Perdido Key Unit of GUIS. This project also leverages GUIS NPS base funds to provide a full-time law enforcement ranger to enforce parking and speed rules on the Perdido Key Unit of GUIS.

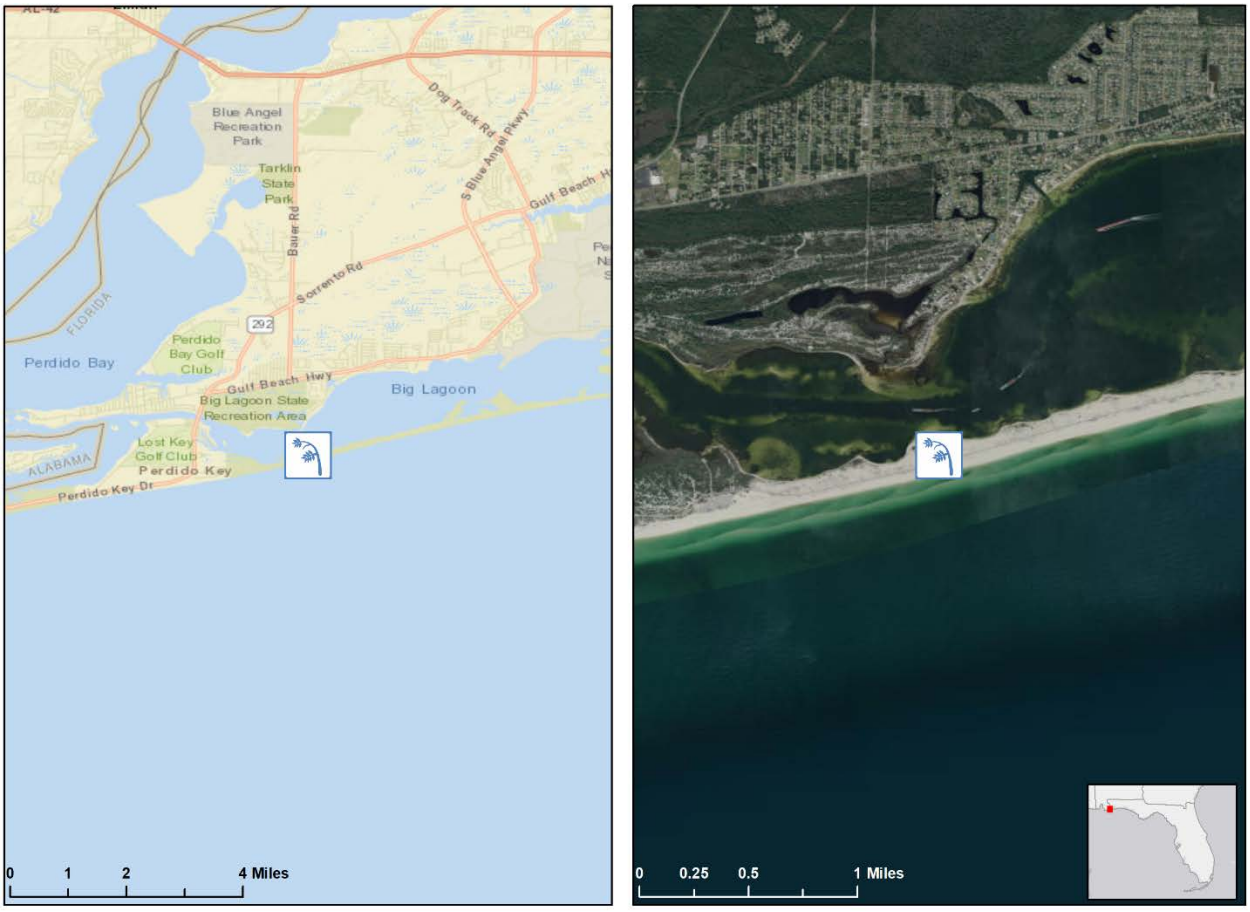
Specifically, the project would:

- **Replace all roadside parking with three designated paved parking lots along the north side of the road** and remove the roadside parking along the narrow two-lane, 2-mile road;
- **Install post-and-rope fencing**, primarily around new parking areas, to guide visitors onto dune crossovers to access the shoreline and away from sensitive beach-dune habitat;
- **Convert the easternmost 0.5 miles of the existing road** to a narrower (12-foot wide), unpaved bicycle-pedestrian-only path;
- **Replace 11 existing dune crossovers with eight new, raised ones** at the north and south ends at each new parking area, at the end of the new bicycle-pedestrian-only path, and at the main parking/pavilion area. The new crossover at the main parking/pavilion area would be compliant with the American with Disabilities Act of 1990 (ADA), providing wheelchair access to the Gulf. The new crossovers would have handrails to limit foot traffic to the crossovers, educational signage, and be raised enough to allow wildlife to pass under them, thus increasing habitat functionality and connectivity in these areas;
- **Implement human and predator disturbance-deterrent measures** such as temporary closure of sensitive areas to protect habitat, wildlife, and nests (including pre-season posted areas suitable for nesting snowy plovers) and to prevent dune trampling and disturbance; symbolic fencing; road crosswalks that function as speed humps and other speed attenuation measures; handrails on dune crossovers; law enforcement patrols to address parking and speeding violations; trash collection and disposal, predator-proof receptacles in the main lot and two smaller lots; and visitor education measures;
- **Install a car counting system at the entrance station to Johnson Beach** to track the number of vehicles and ensure the number that proceed past the gate does not exceed the number of established parking spaces; and,
- **Monitor beach-nesting birds and ensure visitor compliance with posted areas by providing dedicated staff** for 3 years (1 year during construction, 2 years post-construction).

The goal of this project is to reduce habitat disturbance to improve approximately 112 acres of beach-dune habitat at Perdido Key that is home to a wide variety of wildlife, including the Perdido Key beach mouse, nesting sea turtles, a variety of nesting and foraging birds, and a wide variety of plants. This project would also benefit visitors to GUIS, as a result of the changes to the main road, which would increase safety by ensuring the road is passable to emergency vehicles and removing cars on the last 0.5 miles of the road.

General Project Activities and Implementation Timing
Project activities include planning/design (permitting), implementation (construction and oversight), and monitoring. The project should be completed in approximately 3 years. Year 1 would include pre-construction monitoring, final permitting, and construction. Years 2-3 would include post-construction monitoring.
Maintenance
Short-term activities would include inspection and maintenance of amenities. The parking lots would need to be re-surfaced and re-marked every 3 years. The crossovers would likely need periodic repairs but would be made of composite materials rather than wood, so long-term maintenance should be simpler, cheaper, and less frequent than wood crossovers. The fencing would also need repairs over the long-term. All operation and maintenance costs would be covered by GUIS (not project) funding.
Project Monitoring
Project monitoring details can be found in the project's MAM plan located in Appendix B.
Costs
The total estimated project costs are $3,200,000 which includes costs for planning, design, permitting, implementation, monitoring, oversight, and contingency.

Figure 2-2 FM1, Johnson Beach Access Management and Habitat Protection (preferred): General Project Location



FM2, Perdido Key Sediment Placement (preferred)

Restoration Approach

Restore and enhance dunes and beaches (PDARP/PEIS Section 5.5.3.2)

Restoration Technique

Renourish beaches through sediment addition (PDARP/PEIS Appendix 5.D.1.5)

Project Location

Seven-mile south shore of Perdido Key Unit, GUIS, Escambia County (Figure 2-3)

Project Summary

This project would be implemented by the DOI FL TIG Trustee in coordination with the NPS and GUIS staff. The project would partially supplement the natural sediment budget for the Perdido Key Unit of GUIS by placing at least 400,000 cubic yards of sediment dredged from Pensacola Pass onto the easternmost 2 miles of Perdido Key thereby partially restoring injuries to barrier island habitat caused by the DWH oil spill. NPS would work in close coordination with U.S. Army Corps of Engineers (USACE) to place sediment dredged from Pensacola Pass onto the Gulf shoreline of the Perdido Key unit.

Specifically, the project would

- **Re-introduce sand into the barrier-island system**, using a pipeline from the dredging location, through: a "swash-zone" placement (the area extending from the +3-foot-above-mean-high-water [MHW] to mean-low-water [MLW]); or direct "on-beach" placement (the area extending from the +8-foot-above MHW to MHW). The exact placement location would depend on the condition of the shoreline at the time of the next dredging cycle at Pensacola Pass; and,
- **Complete a National Historic Preservation Act Section 106 survey** for the entire 7-mile southern shoreline of the Perdido Key Unit of GUIS to support this and future sediment placement projects.

The goal of the project is to: 1) improve wildlife and plant habitat at Perdido Key, and 2) improve the ability of Perdido Key to withstand the natural erosive effects of storms. The Perdido Key unit of GUIS is an approximately 4-mile section at the easternmost end of Perdido Key. Perdido Key is home to the Perdido Key beach mouse, nesting sea turtles, a variety of nesting and foraging birds, and a wide variety of plants. A historical sediment deficit exists in the system due to the recurring maintenance dredging of the lower harbor federal navigation channel. This dredging, with offshore deposition of sediment, has interrupted the natural westward littoral drift of sand, leading to unnaturally narrow beaches and the diminishment of habitat, storm protection, and recreational opportunities on Perdido Key.

General Project Activities and Implementation Timing

Project activities include planning/design (E&D and permitting), implementation (construction and non-construction), and monitoring. If project activities are coordinated with USACE or Navy operations and maintenance (O&M) dredging in Pensacola Pass or Bay, then dredging activities would not occur with NRDA funds and the project would require significantly less restoration funds.

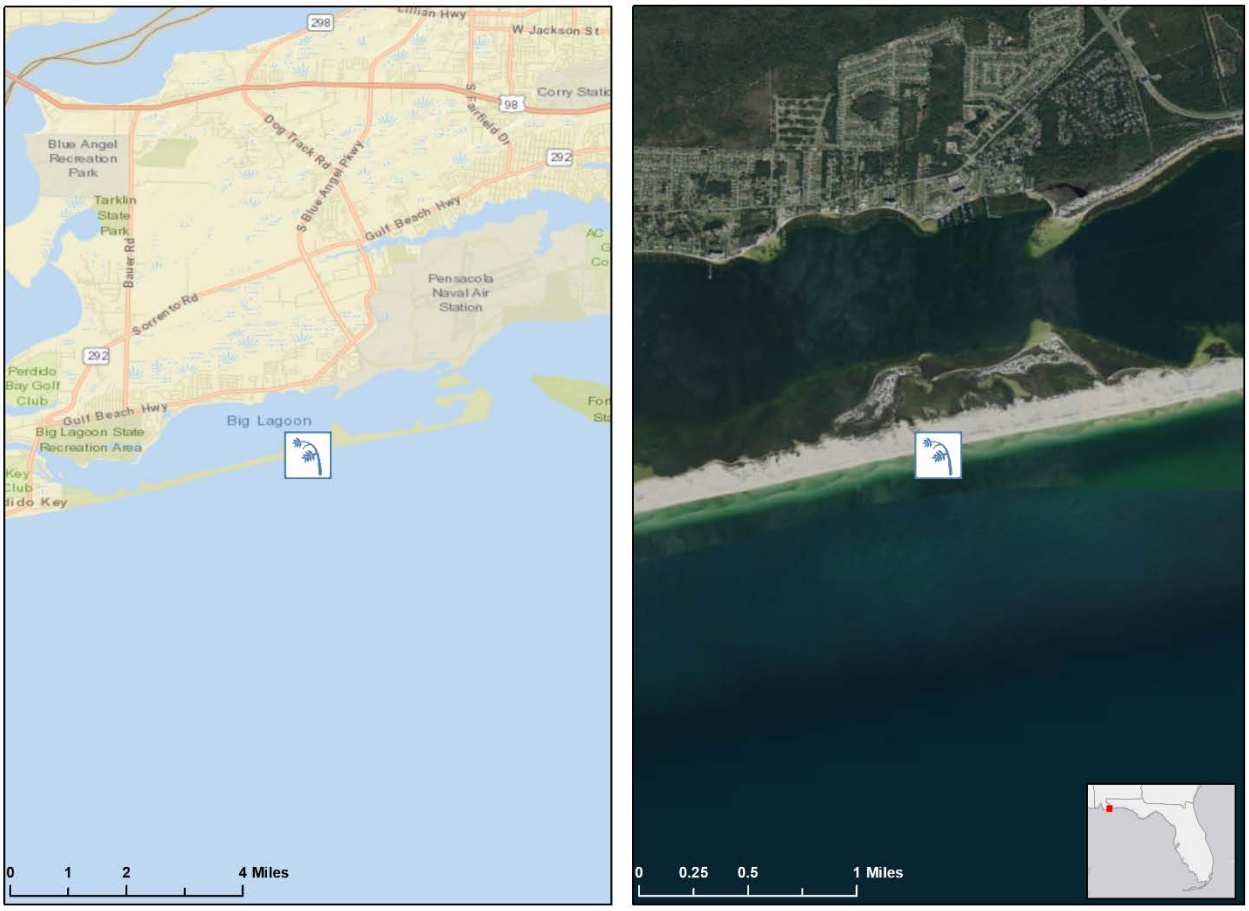
The project should take a maximum of approximately 4-5 years to complete. Once funding is received, it should take 14 months for USACE to prepare an EA and Biological Opinion (BO) for on-beach placement, 3 months to award the design contract, 3 months for design, 3 months to award the construction contract, and 3 months for construction. Post-construction monitoring is expected to take up to 3 years.

Maintenance

Once sand is placed, some short-term maintenance would be required. If deemed necessary (i.e., if the restored beach fails to equilibrate as expected by wave action), any escarpments exceeding 18 inches tall by 100 feet long created in the project/fill area would be leveled following the U.S. Fish and Wildlife Service (USFWS) ESA BO requirements and USFWS guidelines. Also, tilling may be required if sand compaction levels exceed 500 pounds per square inch for 3 years after placement. Project funds would be used for these possible maintenance activities. No long-term maintenance activities are anticipated with project funds.

Project Monitoring
Project monitoring details can be found in the project's MAM plan located in Appendix B.
Costs
The total estimated project costs are $6,773,000 which includes costs for E&D, permitting, implementation, oversight, and contingency. As noted above, if project activities are coordinated with USACE or Navy O&M dredging in Pensacola Pass or Bay, the project would require significantly less restoration funds and result in savings to the FL TIG.

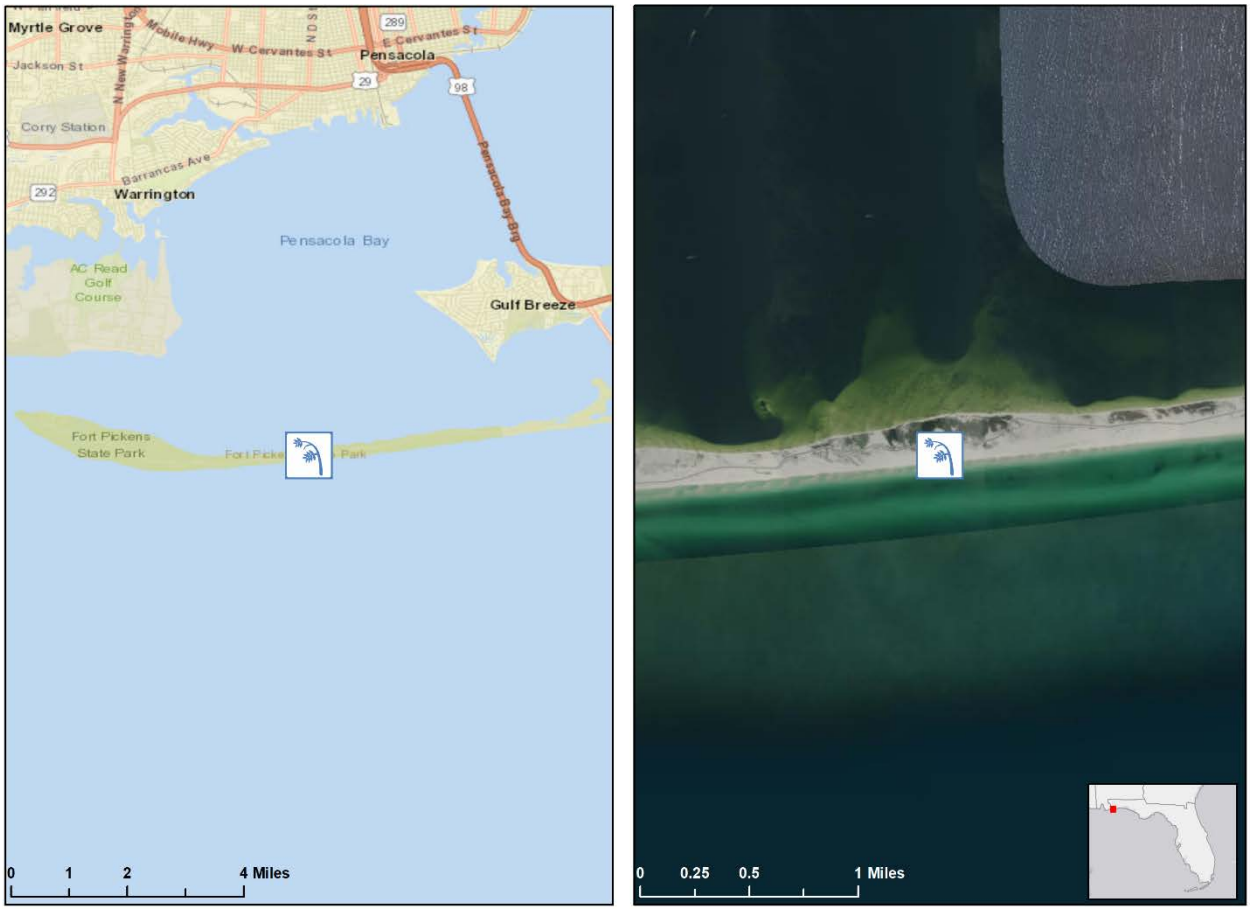
Figure 2-3 FM2, Perdido Key Sediment Placement (preferred): General Project Location



FM3, Old Fort Pickens Road Utility Line Relocation

Restoration Approach
Protect and conserve marine, coastal, estuarine, and riparian habitat (PDARP/PEIS Section 5.5.3.2)
Restoration Technique
Develop and implement management actions in conservation areas and/or restoration projects (PDARP/PEIS Appendix 5.D.1.7)
Project Location
Fort Pickens Unit, GUIS, Escambia County (Figure 2-4)
Project Summary
This project would be implemented by the DOI FL TIG Trustee in coordination with NPS and GUIS staff. In 2017, 1.4 miles of Fort Pickens Road was re-aligned to the north to avoid the storm surges and flooding that were occurring more regularly and putting the road and visitors at risk; however, utility infrastructure (a power cable and force main sewer line) is still present along the original corridor. This project would relocate the utility lines further to the north near the new section of road. Specifically, the project would: • **Remove utility infrastructure:** a #5-size power cable, a 4-inch force main sewer line, and two valve cluster boxes in the former roadbed (1.4 miles) of the recently aligned Fort Pickens Road; • **Rebury the utility lines** along the new section of road to the north. The goal of this project is to 1) relocate utility lines to facilitate natural beach and dune restoration on the 2.5 acres of old roadbed and 2) reduce risk to terrestrial and marine wildlife, habitat, and visitors from beach erosion and exposure of the utility lines in their current location.
General Project Activities and Implementation Timing
Project activities include planning/design (E&D and permitting), implementation (construction), and monitoring. NPS would oversee the sewer line relocation and coordinate with the electric company to move the electric line. The project should be completed in approximately 2-3 years. Once funded, it should take the electric company approximately 6 months to move the line. It should take 3 months to award a design contract for moving the sewer line; 4 months for design; 3 months to award a construction contract; and 4 months for construction. Post-construction monitoring would occur to ensure that the project was completed as scoped.
Maintenance
No short- or long-term maintenance activities are anticipated. However, should one of the lines need maintenance, it would be more easily accessible from the new road.
Project Monitoring
This project has not been identified as a preferred alternative by the FL TIG in this RP/EA, therefore, a project MAM plan has not been developed.
Costs
The total estimated project costs are $1,249,930 which includes costs for planning, design, permitting, implementation, monitoring, oversight, and contingency.

Figure 2-4 FM3, Old Fort Pickens Road Utility Line Relocation: General Project Location



FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits (preferred)

Restoration Approach

Restore and enhance dunes and beaches (PDARP/PEIS Section 5.5.3.2)

Restoration Technique

Enhance dunes and beach habitat through replacing light fixtures

Project Location

Fort Pickens Road, Pensacola Beach, Escambia County (Figure 2-5)

Project Summary

This project would be implemented by the DOI FL TIG Trustee, in coordination with Escambia County and Gulf Power. This project would enhance sea turtle nesting beach habitat quality in Escambia County and GUIS-managed lands by retrofitting streetlights along Fort Pickens Road. The directionality function and long-wavelength color of amber light-emitting diode (LED) lighting upgrades reduce light trespass and sea turtle nesting disorientation on beaches. This project is adjacent and complimentary to the DWH NRDA Improving Habitat Injured by Spill Response: Restoring the Night Sky project that retrofitted Casino Beach parking lot lighting on Pensacola Beach and arterial roads on State Hwy 399 east of Casino Beach. These retrofits benefitted sea turtle nesting habitat in the Santa Rosa Island Unit of GUIS. This project would benefit the nesting beaches in the Fort Pickens Unit of GUIS.

Specifically, the project would:

- **Remove approximately 170 dual-headed, low-pressure, sodium fixtures** along 2 miles of Fort Pickens Road west of Casino Beach to the GUIS boundary;
- **Install 170+ new FWC-certified wildlife-friendly amber LED fixtures** on existing poles and power infrastructure. Existing power infrastructure and poles would remain in place.

The goal of this project is to enhance beach and dune habitat on federal lands by reducing light pollution from adjacent roads. Anthropogenic light sources along beaches and coasts can have negative impacts on the nocturnal behaviors of both nesting sea turtles and hatchlings (Witherington & Martin 2003). Lighting can affect nest site selection, disorient nesting turtles returning to the sea, and interfere with the ability of hatchlings to find the ocean. Turtle-friendly lighting projects reduce light pollution, thereby reducing hatchling disorientation and increasing the number of hatchlings reaching the water. Reducing beachfront lighting is consistent with sea turtle recovery plans as light pollution has been identified as one of the most significant threats to recovery of loggerheads (NMFS and USFWS 2008). Lighting management is also a high-priority conservation action needed for green turtle recovery (NMFS and USFWS 1991; from PDARP/PEIS D.4.3). Target sea turtle species include loggerhead, green, Kemp's ridley, and leatherback. Additionally, new LED fixtures would increase energy efficiency and pedestrian safety along the Fort Pickens Road multi-use path.

General Project Activities and Implementation Timing

Project activities include implementation (non-construction and O&M) and monitoring.

The project should be completed in approximately 3 years. Implementation activities would occur in Year 1 and would be executed by Gulf Power (NextEra) staff. Post-implementation monitoring would occur in Years 2-3. The project would be implemented outside of sea turtle and beach-nesting bird season to prevent take of protected species.

Maintenance

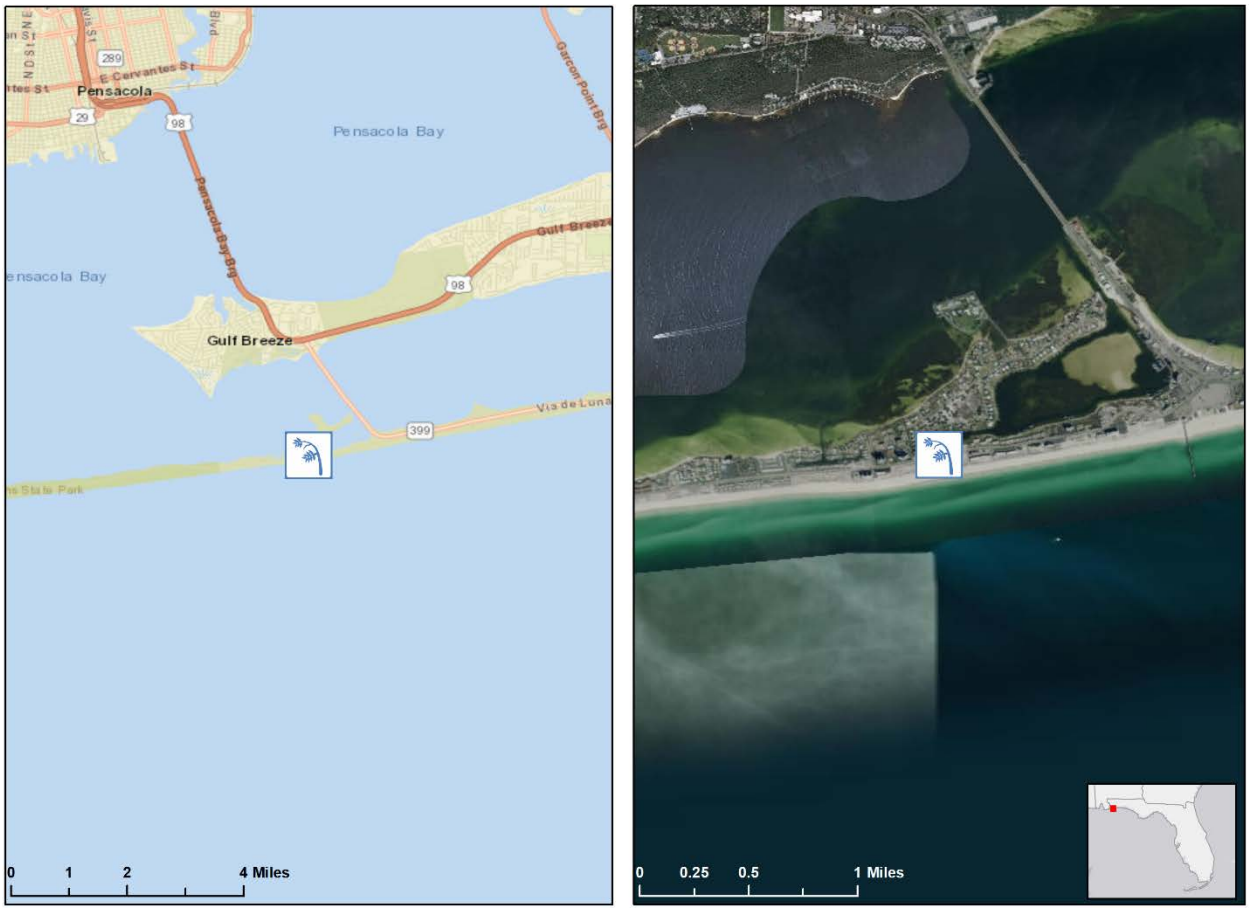
Short-term maintenance activities would include inspection and maintenance of retrofits. Routine fixture and pole maintenance would be conducted by Gulf Power (NextEra). Five years of maintenance costs are included in budget.

Project Monitoring

Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs
The total estimated project costs are $540,000 which includes costs for implementation, monitoring, oversight, and contingency.

Figure 2-5 FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits (preferred): General Project Location



FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred)

Restoration Approach

Protect and conserve marine, coastal, estuarine, and riparian habitats (PDARP/PEIS Section 5.5.3.2)

Restoration Technique

Acquire lands for conservation (PDARP/PEIS Appendix 5.D.1.7)

Project Location

Indian Pass Campground, Gulf County (Figure 2-6)

Project Summary

This project would be implemented by the FWC and DOI FL TIG Trustees, in coordination with USFWS-SVNWR, Gulf County, and Friends of SVNWR. The goal of the project is to acquire and enhance a 10-15-acre parcel at Indian Pass to ensure boating access for continued habitat protection and management activities that protect and enhance DWH-injured resources on SVNWR. Additionally, funding from the Provide and Enhance Recreational Opportunities Restoration Type is proposed for acquiring the parcel and recreational improvements at the acquisition site, as described in Section 2.5.5.

Specifically, the project would:

- **Acquire a 10-15-acre parcel at Indian Pass** for inclusion in SVNWR; and
- **Ensure access and use of the boat dock/slip** (for primary access to SVNWR).

The goal of this project is to secure permanent boat access to federally managed lands at SVNWR. Permanent access to SVNWR would ensure that staff, volunteers, researchers, and cooperators are able to reach the area to protect and manage the habitat and living resources on the island. SVNWR has leased a boat slip from the current landowners for 50 years at a current cost of $14,400 per year. SVNWR is only accessible by boat, therefore, if the site were to sell for development, there is no guarantee that the boat slip would be available. Acquiring the parcel at Indian Pass would not only secure permanent access to SVNWR but would also eliminate the $14,400 per year cost of leasing the parcel, a significant cost savings for SVNWR. Further, losing access to this boat slip would negatively impact research and management of the DWH-injured resources on the island, specifically shorebirds, wading birds, seabirds, and sea turtles and would also impact access for DWH NRDA projects, including the St. Vincent National Wildlife Refuge Predator Control project. If the currently leased boat slip was no longer available, SVNWR's only alternative would be access from the recently purchased "11-mile" boat docking station, approximately 4.1 miles away. In addition to requiring upgrades to deteriorating facilities (approximately $3 million), a 4.1-mile stretch of Class II shellfish waters would have to be dredged for barge access (approximately $8 million) to this alternative location.

General Project Activities and Implementation Timing

Project activities include implementation (construction, non-construction, and O&M) and monitoring. The acquisition would require a professional appraisal, a boundary survey, and a Level 1 contaminants survey.

The project would be completed in approximately 5 years. Acquisition would occur in Years 1-2. Recreational use enhancements (described in Section 2.5.5) would occur after the acquisition is complete.

Maintenance

No short- or long-term maintenance activities are anticipated for the land acquisition portion of this project.

Project Monitoring

Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs

The estimated costs are $3,220,000 out of the Habitat Projects on Federally Managed Lands Restoration Type which includes costs for implementation, monitoring, oversight, and contingency associated with the acquisition. A portion of the acquisition costs and the recreational use enhancements, estimated to be

$2,500,000, would be funded under the Provide and Enhance Recreational Opportunities Restoration Type described in Section 2.5.5. As such, the total project cost would be $5,720,000.

Figure 2-6 **FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred): General Project Location**

2.5.2 Project Descriptions: Sea Turtles

This RP/EA identifies four restoration alternatives consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal (PDARP/PEIS Section 5.3.1) and underlying Sea Turtles Restoration Type (PDARP/PEIS Section 5.5.10):

1. Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast (preferred);
2. Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast (preferred);
3. Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast (preferred); and
4. Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast.

A description of each of these restoration alternatives is provided below.

ST1, Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast (preferred)

Restoration Approach
Reduce sea turtle bycatch in recreational fisheries through development and implementation of conservation measures (PDARP/PEIS Section 5.5.10.2)
Restoration Technique
Evaluate, develop, and implement conservation measures to reduce bycatch in pier- and shore-based recreational fisheries (Strategic Framework for Sea Turtle Restoration Activities; Module 4, Section 2.2.4)
Project Location
Eight piers on the Florida Gulf Coast (from west to east): Pensacola Beach Pier – Escambia County; Navarre Beach Pier – Santa Rosa County; Fort Walton Beach Pier – Okaloosa County; MB Miller County Pier and Russell-Fields City Pier – Bay County; Clearwater Beach Pier – Pinellas County; Venice Pier – Sarasota County; Naples Pier – Collier County (Figure 2-7)
Project Summary
This project would be implemented by the FWC FL TIG Trustee. Project partners may include local governments, who oversee the majority of fishing piers along the Gulf; FDEP, who manages submerged land leases for piers; federal government agencies (e.g., NOAA); and participants in the existing FWC Marine Turtle Permit Holder program which includes all Florida sea turtle rehabilitation facilities, sea turtle veterinarians, and stranding response personnel. Organizations involved in sea turtle conservation in Florida such as Loggerhead Marinelife Center, the organization implementing the Responsible Pier Initiative, would also be invited to participate in this effort. The project involves collecting information and developing a response strategy for sea turtles incidentally captured (hooked and/or entangled) at eight Florida Gulf Coast fishing piers and to target a reduction in incidental capture of sea turtles. The FL TIG would coordinate implementation of this project with the RW TIG, which is currently planning restoration for sea turtles.[33] Specifically, this project would: • **Collate information on incidental capture** by excerpting information from existing Florida Sea Turtle Stranding and Salvage Network (STSSN) records and from the Responsible Pier Initiative; o Survey local governments, pier operators, FWC Permit Holders who respond to incidental captures, and FWC-permitted sea turtle rehabilitation facilities on existing response methods, deficiencies, and needs; • **Review commercial and local government piers** along Florida's northwest and southwest peninsular Gulf shoreline[34]: o Visit piers to document existing conditions, including hours, management, and signage; o Conduct preliminary surveys of pier managers and fisherman on sightings and captures of sea turtles; • **Establish FWC (state) observers on larger piers** during periods with high reported capture rates: o Conduct systematic surveys for sea turtle presence around the pier and track information on incidental hooking and captures; o Collect specific information on bait type, gear, hook type, weather conditions, water clarity, tidal stage, fishing pressure (e.g., number of fishers on the pier), flotsam, and other biological and physical characteristics when incidental hooking and capture occurs;

[33] The RW TIG NOI for restoration planning can be found at www.gulfspillrestoration.noaa.gov/2020/07/regionwide-trustees-initiate-restoration-planning.

[34] Project activities would not overlap with, supplement, or replace activities required under ESA Section 7 Biological Opinion for certain piers.

- Respond to hooked sea turtles, including handling and transport or coordination with the existing Marine Turtle Permit Holder network;

- **Convene an expert working group** to develop a standardized response strategy for incidentally hooked sea turtles (i.e., FWC Sea Turtle Incidental Hooking and Capture Plan [Plan]);
  - Conduct video conferences (and one in-person meeting, if feasible) with agency, stranding, and rehabilitation personnel including facility managers and veterinary staff;
  - Establish facility needs for treatment and care of incidentally hooked sea turtles, including assessment of possible funding sources to address required staffing and equipment;
  - Utilize existing information and information collected during this project to develop voluntary guidance to minimize potential for capture of sea turtles and reduce impacts to incidentally hooked animals;
  - Incorporate methods into the Plan that would be available for voluntary use on Florida fishing piers;

- **Coordinate with pier operators** on voluntary implementation of the Plan;
  - Provide standardized signage, educational resources including social media approaches, online webinars or training to pier operators, local government staff, park staff, and sea turtle responders.

The goal of this project is to evaluate current conditions and develop a comprehensive response strategy for sea turtles incidentally captured (hooked and/or entangled). Reports of incidental captures are increasing, and additional information to more fully inform appropriate response actions are necessary to maximize successful outcomes. This project would target a reduction in incidental capture of sea turtles (specifically, Kemp's ridley, loggerhead, and green) at eight fishing piers by providing standardized instruction on appropriate fisher behavior when sea turtles have been observed or previously hooked that day.

Development of a training program on how to respond to larger sea turtles and provision of appropriate equipment would enable managers of large commercial piers to respond appropriately when a larger sea turtle is hooked, thereby resulting in increased survival. This project would also improve response and recovery of animals that are hooked and captured by improving reporting protocols and better educating anglers on how to react if they accidentally hook a turtle. Reducing capture rates and improving response outcomes should ultimately reduce overall mortality of sea turtles at fishing piers.

General Project Activities and Implementation Timing

Project activities include implementation (non-construction). The project would be completed in approximately 5 years. Collating information, conducting pier reviews, and establishing part-time state biologists (state pier observers) would occur in Years 1-4. Convening an expert working group to develop a standardized response strategy would occur in Years 2-3. Developing the Sea Turtle Incidental Hooking and Capture Plan and coordinating with pier operators on voluntary implementation would occur in Years 3-5.

Maintenance

Short-term maintenance activities would include pier operators and local governments maintaining all signage and equipment and keeping them up-to-date and in good condition. No long-term maintenance activities are anticipated.

Project Monitoring

Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs

The total estimated project costs are $1,394,808 which includes costs for implementation, oversight, indirect costs, and contingency.

Figure 2-7 ST1, Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast (preferred): General Project Location

ST2, Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast (preferred)

Restoration Approach

Increase sea turtle survival through enhanced mortality investigation, and early detection of and response to anthropogenic threats and emergency events (PDARP/PEIS Section 5.5.10.2)

Restoration Technique

Reduce marine debris (Strategic Framework for Sea Turtle Restoration Activities; Module 4, Section 2.2.6)

Project Location

Florida Gulf Coast (Escambia-Monroe Counties; Figure 2-8)

Project Summary

This project would be implemented by the FWC FL TIG Trustee. Other project partners may include Gulf Coast-based non-governmental organizations (NGOs; e.g., Ocean Aid 360, Clearwater Marine Aquarium, Sarasota Bay Watch, Apalachicola Riverkeeper), local, state, and federal partners (e.g., NOAA, USEPA, FDEP, county-managed piers[35], marinas, bridges), and educational institutions/university-based programs (e.g., University of Florida, Florida Sea Grant). The objective of this project is to reduce the threat and impacts (e.g., entanglement, entrapment, ingestion) of marine debris to DWH-injured sea turtle species in Florida, with a primary focus on in-water derelict fishing gear (e.g., monofilament fishing line, nets, trap/pot gear, other recreational/commercial fishing equipment that has been lost, abandoned, or discarded). This project would support actions identified in the Florida Marine Debris Reduction Plan. The FL TIG would coordinate implementation of this project with the RW TIG, which is currently planning restoration for sea turtles.

Specifically, this project would:

- **Identify marine debris "hotspots"**[36] that impact, or have the potential to impact, sea turtles in Florida. Data would be compiled from federal and state agencies and other relevant partners (e.g., STSSN partners, rescue/rehabilitation organizations, NGOs, dive operators);
- **Reduce the number of, and potential for, marine debris-related incidences** at up to 16 hotspots using the following techniques, as appropriate:
    - Remove marine debris. Includes enhancing support (e.g., capacity, equipment, fuel) for debris removal events, including the use of professional divers or marine salvage crews around deep structures. Debris removal may be a one-time or multi-event effort depending on the degree/frequency of debris accumulation, impact on sea turtles, cost, and logistics. Debris removal may be conducted in coordination with or to enhance existing marine debris networks (e.g., Gulf Coast clean-ups) or as additional stand-alone events.
        - Develop or utilize an existing uniform/standardized reporting system for data collection (e.g., type and weight of debris removed). There are a number of existing available protocols to choose from or that could be adapted for use (e.g., the Marine Debris Tracker App, USEPA's Escaped Trash Assessment Protocol). Information (e.g., project status, maps, debris findings, marine debris resources and materials) would be available on a public website. Consistency in data collection would improve the rigor and types of subsequent analyses, enable assessment of the effectiveness of debris removal efforts, and inform future restoration planning for sea turtles;

[35] Project activities would not overlap with, supplement, or replace activities required under ESA Section 7 Biological Opinion for certain piers.

[36] Hotspots may be characterized by a number of criteria including but not limited to: locations with a high frequency of marine debris-related sea turtle injuries or mortalities; locations where sea turtle habitat (e.g., foraging) intersects with high-recreational use locations (e.g., boat ramps, fishing piers, jetties, artificial and natural reefs) or commercial fishing activities (e.g., derelict pots/traps or other commercial debris); and/or locations that serve as sources of marine debris or pathways for introduction.

- Provide public education and outreach, where appropriate, to reduce re-accumulation of marine debris. This could include presentations to local communities and organizations (who may adopt local clean-up events) and key stakeholders and user groups, providing signage at high-use areas (e.g., fishing piers) or businesses (e.g., fishing gear retailers), and distributing outreach materials on the dangers of marine debris on sea turtles.

- **Increase capacity and approaches for fishing gear collection and disposal** (e.g., monofilament recycling bins, arrangement of maintenance services, expanding sustainable disposal options).

The goal of this project is to reduce the amount of derelict fishing gear in hotspot areas where it poses a hazard to sea turtle species (including Kemp's ridley, loggerhead, leatherback, green, and hawksbills sea turtles). Injury and/or mortality of sea turtles from ingestion, entanglement, and entrapment in marine debris, namely derelict fishing gear, are well-documented. For example, sea turtles can become entangled in monofilament fishing line, ingest fishing gear (e.g., hooks, line), or become trapped in derelict nets, traps, and pots (e.g., ghost fishing). Prevention and removal of marine debris would reduce mortality of sea turtles. Additionally, ancillary benefits to other species (e.g., birds, marine mammals) as well as habitats such as reefs, seagrass beds, and marshes that are negatively impacted by marine debris are expected.

General Project Activities and Implementation Timing

Project activities include implementation (non-construction and O&M) and monitoring.

The project would be completed in approximately 7 years. Identification/prioritization of hotspots would occur in Year 1 (initial) and Years 2-5 (as needed with new information/impacts). Implementation would occur in Years 2-7. Monitoring would run concurrent with project restoration activities (Years 2-7).

Maintenance

Short-term maintenance activities would include making sure project-related materials are available and functioning properly (e.g., gear disposal/recycling bins, trashcans, dumpsters, signage, other outreach materials). No long-term maintenance activities are anticipated.

Project Monitoring

Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs

The total estimated costs are $3,667,400 which includes costs for implementation, monitoring, oversight, indirect costs, and contingency.

Figure 2-8 **ST2, Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast (preferred): General Project Location**

ST3, Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast (preferred)

Restoration Approach

Reduce injury and mortality of sea turtles from vessel strikes (PDARP/PEIS Section 5.5.10.2)

Restoration Technique

Reduce injury and mortality of sea turtles from vessel strikes (PDARP/PEIS Appendix 5.D.4.7)

Project Location

East Pass (Okaloosa County), Blind Pass (Pinellas County), and San Carlos Bay Entrance (Lee County; Figure 2-9)

Project Summary

This project would be implemented by the FWC FL TIG Trustee in partnership with Florida State University. The project would work to reduce the mortality of multiple sea turtle species (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) from injuries due to strikes by motorized watercraft. This multi-stage project would obtain information on the distribution of sea turtles and vessels in areas previously identified as hotspots of vessel strike mortality of sea turtles and assess the willingness of local communities to change their behavior to reduce the risk of watercraft-related mortality of sea turtles. This project would build on work completed through grants from NFWF's Sea Turtles Program (Mitigating the exposure of sea turtles to vessel strikes in Florida) and from the Florida Sea Turtle License Plate program (Understanding the exposure of sea turtles to vessels: determining the potential impacts of vessel strikes in south Florida).

Specifically, this project would:

- **Compile data on sea turtles** by collating existing and/or obtaining new information, as needed, on the habitat use, behavior, and temporal distribution of sea turtles at selected passes in the Gulf where injury by motorized watercraft is high;
- **Quantify vessel use and activity** at the same passes;
- **Compile data on vessel strikes** by collating existing and/or obtaining new information, as needed, to determine the overlap between sea turtles and vessels at the selected passes and identify areas with low, medium, and high risk of a vessel strike;
- **Obtain information on factors** that may influence the risk of a vessel strikes for sea turtles;
- **Conduct surveys of boaters** to assess the acceptability and perception of boaters to identified strategies to reduce vessel strikes;
- **Quantify the willingness and potential motivation of boaters** to change their boating practices to reduce vessel strikes of sea turtles;
- **Conduct a public awareness campaign** at each pass, targeting boat users (e.g., boat rental companies, shops, piers), to educate the public about the presence of sea turtles, the threat of a vessel strikes for sea turtles, and to suggest strategies for boaters that would reduce vessel strikes and encourage responsible boating practices.

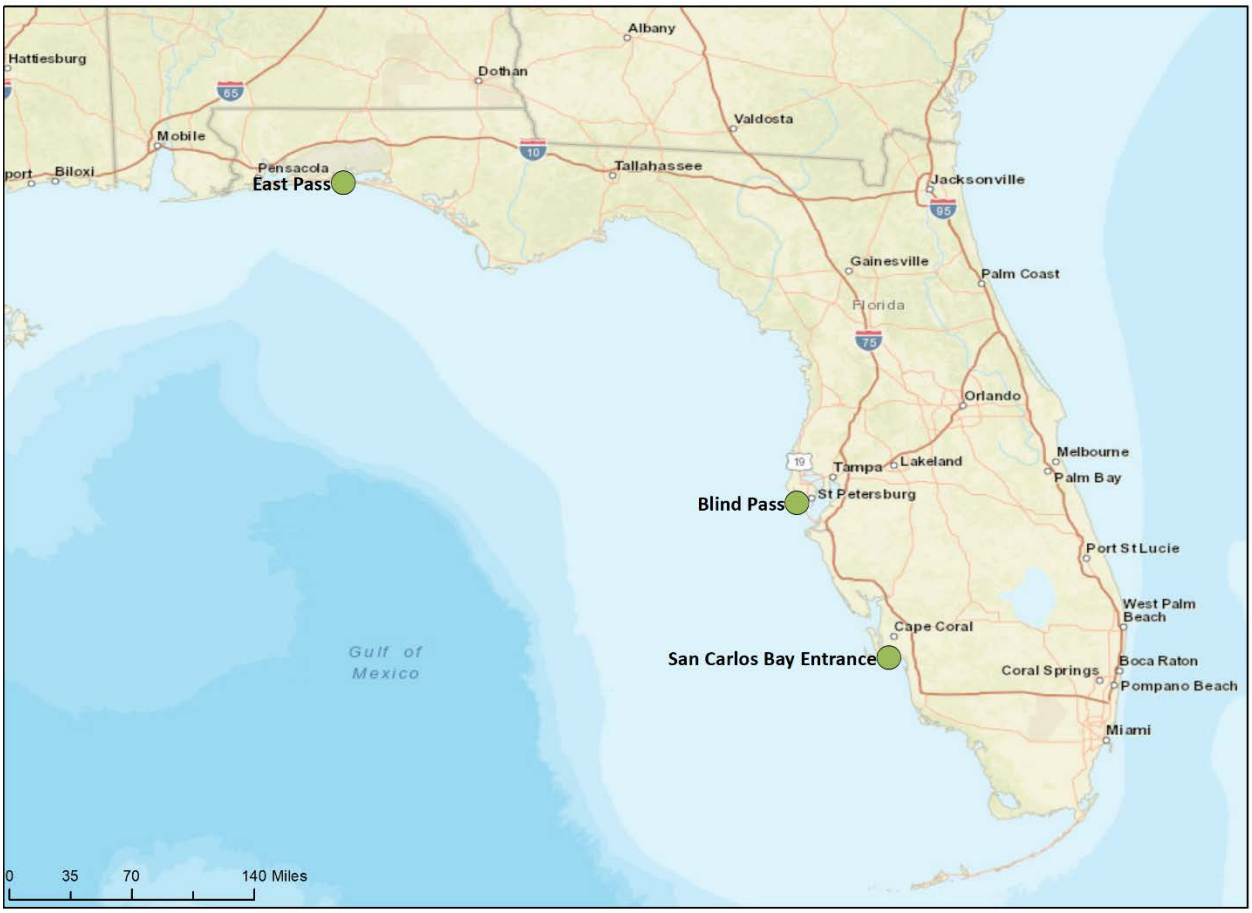
The goal of this project is to compile data on sea turtles and vessel strikes, gauge public opinion on different types of management strategies, educate the public on the need for these efforts, and potentially reduce the number of sea turtles that are struck by vessels by educating boaters on ways to reduce their chances of striking a sea turtle. These activities would help compensate for losses to sea turtles from the DWH oil spill.

General Project Activities and Implementation Timing

Project activities include implementation (non-construction) such as visually documenting sea turtles through surface transect surveys, studies of boating activity, assessments of risks for sea turtles from vessel strikes, determinations of local public opinion on potential conservation measures, and outreach to the public that focuses on boaters.

The project would be completed in 5 years. The transect surveys for sea turtles, the studies of boating activity, and the assessments of risks for sea turtles from vessel strikes would be conducted first and would be completed in approximately 3 years. The public outreach would depend upon the results of this work and would begin in Year 4 and completed in Year 5.
Maintenance
Short-term maintenance activities would include making sure project-related materials are available and functioning properly (e.g., gear disposal/recycling bins, trashcans, dumpsters, signage, other outreach materials). No long-term maintenance activities are anticipated.
Project Monitoring
Project monitoring details can be found in the project's MAM plan located in Appendix B.
Costs
The total estimated costs are $1,155,000 which includes costs for implementation, indirect costs, and contingency.

Figure 2-9 ST3, Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast (preferred): General Project Location



ST4, Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast

Restoration Approach

Enhance sea turtle hatchling productivity and restore and conserve nesting beach habitat (PDARP/PEIS Section 5.5.10.2)

Restoration Technique

Enhance protection of nests by addressing anthropogenic threats; reduce nesting beach barriers; and, beach user outreach and education (PDARP/PEIS Appendix 5.D.4.3)

Project Location

Florida Gulf Coast (Escambia-Monroe Counties; Figure 2-10)

Project Summary

This project would be implemented by the FWC and DOI FL TIG Trustees. Project partners include state agencies, state and federal parks, local governments, and conservation organizations. This project includes restoring and improving sea turtle nesting habitat by removing physical shoreline barriers on Florida's Gulf coast nesting beaches. Physical barriers include manmade and natural permanent/semi-permanent barriers to nesting and hatchlings (e.g., dilapidated sea walls and large logs and trees from storm deposits) and non-permanent barriers (e.g., abandoned beach furniture and recreational equipment). The FL TIG would coordinate implementation of this project with the RW TIG, which is currently planning restoration for sea turtles.

Specifically, the project would:

- **Identify physical shoreline barriers** to nesting sea turtles and emerging hatchlings on beaches to help offset the harm caused by the DWH oil spill;
- **Develop/implement site-specific restoration plans**;
- **Identify potential partners**, including public and private partners, and work with local stakeholders to implement site plans. At each site, local businesses and organizations would be contacted for their support and collaboration, providing them with information about the project, an opportunity to participate, as well as the benefits of local media attention to participation in the event.
- **Contract machinery and other equipment for large barrier removals**. Removed items and materials would be categorized and recorded, sorted, and where appropriate recycled, thus reducing the impact on local landfills;
- **Develop educational materials** for use by local media outlets to promote barrier removal events, and involve the public in barrier removal activities where appropriate to increase awareness and educate the public about barriers to nesting sea turtles and hatchlings. Materials would borrow from and be consistent with existing sea turtle outreach and educational programs in Florida.

In 2015, the Archie Carr Center for Sea Turtle Research held a workshop to develop a strategic plan for Florida sea turtles as part of Disney's Reverse the Decline of Florida Sea Turtles initiative. Based on the input of more than 30 experts, several key strategies were identified to address threats to Florida sea turtles, including increasing the quantity and quality of sea turtle nesting habitats in Florida and removing physical barriers.

General Project Activities and Implementation Timing

Project activities include planning/design (feasibility studies, E&D), implementation (construction, non-construction), and monitoring.

The project would be completed in approximately 5 years. Year 1 activities would include identifying barriers to nesting sea turtles on beaches, creating an inventory of beach characteristics that meet suitable conditions for nesting, and collating existing information on known nest sites and the density and diversity of nesting, threats and management activities into a database. Year 2 activities would include developing site restoration plans including type of threat, timeline, resources needed, permits, and budget. Years 3-5 activities would identify

public and private partners for removal of barriers following site plans; contract machinery and remove debris; use local media to promote the activity and educate to increase awareness; and monitor project success.
Maintenance
No short- or long-term maintenance activities are anticipated.
Project Monitoring
This project has not been identified as a preferred alternative by the FL TIG in this RP/EA, therefore, a project MAM plan has not been developed.
Costs
The total estimated costs are $1,492,700 which includes costs for planning, design, implementation, monitoring, oversight, and contingency.

Figure 2-10 ST4, Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast: General Project Location

2.5.3 Project Descriptions: Marine Mammals

This RP/EA identifies two restoration alternatives consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal (PDARP/PEIS Section 5.3.1) and underlying Marine Mammals Restoration Type (PDARP/PEIS Section 5.5.11):

1. Florida Gulf Coast Marine Mammal Stranding Network (preferred);
2. Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities.

A description of each of these restoration alternatives is provided below.

MM1, Florida Gulf Coast Marine Mammal Stranding Network (preferred)

Restoration Approach

Increase marine mammal survival through better understanding of causes of illness and death as well as early detection and intervention for anthropogenic and natural threats (PDARP/PEIS Section 5.5.11.2)

Restoration Technique

Expand the MMSN's capabilities along the coast of the Gulf; Develop and increase the technical and infrastructure capabilities to respond to major stranding events or disasters (PDARP/PEIS Appendix 5.D.5.3)

Project Location

Florida Gulf Coast (Figure 2-11)

Project Summary

This project would be implemented by the FWC and NOAA FL TIG Trustees in coordination with the National Marine Fisheries Service (NMFS). Other project partners include NFWF, Gulf World Marine Institute, Emerald Coast Wildlife Refuge, University of Florida, Clearwater Marine Aquarium, Mote Marine Laboratory, and Dolphins Plus Marine Mammal Responder. The project would enhance the MMSN's capabilities to identify, characterize, and quantify marine mammal[37] morbidity and mortality factors and provide conservation managers critical and timely information needed to inform effective actions and plans aimed at mitigating or eliminating threats to marine mammal species. Mortality investigations would also provide a critical feedback loop to help assess the effectiveness of management actions over time. This project would build on work funded through the NFWF-GEBF Increased Capacity for Marine Mammal Response and Analysis project.

Specifically, this project would support:

- **Staff and Equipment**. Personnel, equipment, stranding, training, or other professionally related travel, vehicle fuel, and maintenance of vehicles/vessels/trailers to federally permitted Gulf MMSN organizations to rapidly respond to live and dead stranded marine mammals on the Gulf Coast of Florida;
- **Data Collection**. Maintain data collection, reporting, collaboration, and consistency across the MMSN;
- **Response Time**. Maintain response time to live or dead stranded marine mammals;
- **Response**. Maintain MMSN capacity to respond to unusual natural or anthropogenic events (e.g., oil spills, harmful algal blooms, freshwater events, hurricanes);
- **Necropsies**. Maintain MMSN capacity to perform necropsies to understand marine mammal health and threats to support effective conservation management of marine mammals across the region.

The goal of this project is to increase marine mammal survival through improving understanding of key causes of morbidity and mortality and improving the early detection and mitigation of anthropogenic or natural threats. The project would sustain the enhancements achieved through the NFWF-GEBF funded work for an additional 5 years. This includes maintaining the quality and quantity of Level A, B, and C data[38] collected by MMSN organizations and entering the data in regional marine mammal health and stranding databases (e.g., GulfMAP, CETACEAN) to inform data-driven management actions aimed at reducing marine mammal mortality (e.g., stock assessments, conservation actions, recovery plans). The proposed project would reduce the risk of future harm

[37] While the distribution of West Indian manatees overlaps with the DWH oil footprint, none were sighted in oil, and they are not considered in the DWH injury assessment. Therefore, manatees are not eligible for restoration funding and, in this project description, references to marine mammals are limited to cetaceans. However, manatees may indirectly benefit from some of the activities associated with this project, which include equipment, personnel, and resources for responding to comprehensive marine mammal strandings and investigating UMEs, both of which may impact multiple species. Although cetaceans are prioritized, manatees may also end up benefitting from maintaining the stranding network capacity.

[38] Level A data is the minimum data that is required to be collected from any stranded marine mammal (e.g., information on the stranding event, morphology, life history, biology). Level B data encompasses supplementary data such as photographs, morphometrics, and any health assessment information. Level C data includes any lab work or analyses such as necropsy exam, tissue collection, and sample processing data.

to marine mammals living in the Gulf through acquiring timely information on threats, thereby addressing impacts from the DWH oil spill.
General Project Activities and Implementation Timing
Project activities include implementation (non-construction), specifically live and dead marine mammal stranding responses. Live animals would be evaluated in the field and released, transported to a rehabilitation facility, or euthanized. Carcasses would be processed in the field or at a necropsy facility. Level A, B, and C data would be collected and provided to federal managers (NMFS) and included in databases such as GulfMAP and CETACEAN. The project is expected to cover approximately 5 years. However, due to the uncertainty in the timing and quantity of marine mammal strandings, the project could extend beyond 5 years. This project would commence in July 2023 and the project would be completed once the funds are expended.
Maintenance
Short-term maintenance activities would include maintaining response vehicles, vessels, and equipment to support effective and timely stranding response. No long-term maintenance activities are anticipated.
Project Monitoring
Project monitoring details can be found in the project's MAM plan located in Appendix B.
Costs
The total estimated costs are $5,000,000 which includes costs for implementation, oversight, and project management.[39]

[39] $39,315 of the total $5,000,000 in the FL TIG's Marine Mammals Restoration Type base allocation was obligated for planning purposes earlier in 2020. The FL TIG now proposes to use $39,315 in earned interest to increase the total allocation to the Marine Mammals Restoration Type to $5,039,315 in order to provide the full $5,000,000 for the Marine Mammals restoration project proposed herein. The programmatic and Restoration Type goals for Marine Mammals, as described in this RP/EA, would continue to be met by funding this project. The application of interest would be in addition to the base allocation for the Marine Mammals Restoration Type provided for the FL Restoration Area in the Consent Decree.

Figure 2-11 MM1, Florida Gulf Coast Marine Mammal Stranding Network (preferred): General Project Location

MM2, Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities

Restoration Approach

Reduce injury, harm, and mortality to bottlenose dolphins by reducing illegal feeding and harassment activities (PDARP/PEIS Section 5.5.11.2)

Restoration Techniques

Reduce lethal and harmful impacts on dolphins from illegal feeing activities by effectively changing human behavior (DWH Strategic Framework for Marine Mammal Restoration Activities, Module 4)

Project Location

The human dimension social science studies would be conducted in several Florida Gulf Coast locations, as determined in coordination with the professional contractor conducting the surveys and Implementing Trustees. The following information would be used to determine locations for conducting social science studies: (1) known hotspot locations for illegal feeding activities, and (2) outcomes of previously conducted social science studies. Studies are anticipated to occur at select locations in Florida and include a portion of representative user groups (e.g., commercial tour operators, residents, tourists). Distribution and communication of the outreach strategies could be conducted all over Florida and would be determined by the comprehensive outreach strategy that would be developed in Phase 1 of the project (Figure 2-12).

Project Summary

This project would be implemented by the NOAA FL TIG Trustee in coordination with FWC. The overall goal of this project is to provide restoration benefits to Gulf bottlenose dolphins by reducing the number of injuries and mortalities due to illegal feeding. This project aims to reduce lethal impacts to dolphins from illegal feeding activities by effectively changing human behaviors through a targeted outreach and education strategy.

Specifically, this project would:

- Phase 1
    - **Review outcomes from social science studies** previously conducted for dolphin-human interactions and evaluating additional needs;
    - **Conduct additional social science studies** (e.g., focus groups, interviews) in a portion of user groups (e.g., ecotour businesses, residents, tourists);
    - **Develop a comprehensive, targeted outreach strategy** based on study results;
- Phase 2
    - **Design and produce outreach materials** based on the outreach strategy;
    - **Distribute and communicate education tools and messages**, through partnerships with FWC and other stakeholders to reach targeted user groups; and
    - **Repeat social science studies** to evaluate the use of informed and targeted outreach to effectively change human behaviors.

The goal of the project is to reduce the occurrence of people illegally feeding dolphins, thus preventing associated injury and mortality of dolphins in Florida state waters. Illegal feeding of wild dolphins has been documented extensively along Florida's Gulf Coast and by various water users (e.g., tourism vessels, commercial and recreational fishermen). Fed dolphins approach boats more readily looking for handouts, thus increasing the animals' risk for boat strike or gear entanglement. Fed dolphins can also become targets for human acts of retaliation, including fishers who become frustrated by dolphins begging, removing bait or catch from their lines, or scavenging on undersized throwbacks. Begging behaviors can be taught to other dolphins via social learning, thus perpetuating and increasing the prevalence of the problem over time. By decreasing the frequency of these illegal feeding events, the project would reduce the likelihood of these dangerous

interactions. This project would benefit bottlenose dolphins in all areas of Florida where illegal feeding activities occur.
General Project Activities and Implementation Timing
Project activities include planning (about 20 percent), implementation (about 70 percent), and monitoring (about 10 percent). Phase 1 would inform related planning and implementation activities in Phase 2. Implementation in Phase 1 includes hiring a professional contractor to conduct the social science studies and analyze the results, and based on the results of the studies, developing a comprehensive outreach strategy targeting identified user groups. Phase 2 would include hiring a professional contractor to design and produce any outreach products identified in the strategy and partnering with FWC and others to widely distribute and communicate messages. The total project duration for both phases is approximately 6 years with approximately 3 years for Phase 1 and 3 years for Phase 2.
Maintenance
No short- or long-term maintenance activities are anticipated.
Project Monitoring
This project has not been identified as a preferred alternative by the FL TIG in this RP/EA, therefore, a project MAM plan has not been developed.
Costs
The total estimated costs are $2,399,300 which includes costs for planning, design, implementation, monitoring, oversight, and contingency.

Figure 2-12 MM2, Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities: General Project Location

2.5.4 Project Descriptions: Birds

This RP/EA identifies five restoration alternatives consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal (PDARP/PEIS Section 5.3.1) and underlying Birds Restoration Type (PDARP/PEIS Section 5.5.12):

1. Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers (preferred);
2. Egmont Key Vegetation Management and Dune Retention (preferred);
3. Northeast Florida Coastal Predation Management (preferred);
4. Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years (preferred); and
5. Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years.

A description of each of these restoration alternatives is provided below.

B1, Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers (preferred)

Restoration Approach

Restore and conserve bird nesting and foraging habitat (PDARP/PEIS Section 5.5.12.2)

Restoration Technique

Create or enhance oyster shell rakes and beds (PDARP/PEIS Appendix 5.D.6.1)

Project Location

Gomez Key, Levy County (Figure 2-13)

Project Summary

This project would be implemented by the FWC FL TIG Trustee. This project would restore and enhance critical nesting and foraging habitat for American oystercatchers on a small island, Gomez Key, by integrating a combination of habitat restoration strategies to prevent erosion, increase sedimentation, promote oyster recolonization, and expand and elevate potential American oystercatcher nesting habitat.

Specifically, this project would:

- **Provide durable structure and surface area through cultch placement** (approximately 2-5 acres, including breakwaters) for oyster reef expansion and recolonization in the intertidal zone; and expand potential American oystercatcher nesting habitat above the MHW line;
- **Install native rock** (e.g., limestone, shell) **breakwaters** along the wave-ward side of the island to dissipate wave energy and increase sediment deposition on the island.

The goal of this project is to restore and enhance American oystercatcher nesting and foraging locations on Gomez Key to prevent further erosion and loss of this critical habitat and to increase reproductive success in the area. Habitat loss in the intertidal waters around Cedar Key is the primary threat facing the breeding population of American oystercatchers in the southern half of the Big Bend region of Florida's Gulf Coast (from the Apalachicola River to just north of Tampa Bay, including Gomez Key). Many small, but critically important, nesting sites are already threatened by overwash and erosion during the normal tidal cycle. Extensive work on oysters in the area indicates that oyster larvae are present in the system and the limiting factor for oyster resettlement is the presence of hard substrate. Past projects in the area, including the NFWF-GEBF Recovery and Resilience of Oyster Reefs in the Big Bend of Florida project, have been successful at reestablishing oysters. This project would support and expand the nesting population of American oystercatchers in the Southern Big Bend and would help compensate for injuries to American oystercatchers from the DWH oil spill.

General Project Activities and Implementation Timing

Project activities include planning/design (E&D and permitting), implementation (construction and non-construction), and monitoring. All on-site project activities would be restricted to the non-breeding seasons (August-February).

The project would be completed in approximately 5 years. Year 1 would include planning and design. Year 2 would include permitting and pre-restoration monitoring. Years 3-4 would include construction and monitoring. Year 5 would include post-construction monitoring.

Maintenance

No short-term maintenance activities are anticipated. Ongoing long-term monitoring for breeding American oystercatchers and habitat features would identify any long-term maintenance needs.

Project Monitoring

Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs

The total estimated costs are $1,748,639 which includes costs for planning, design, permitting, implementation, monitoring, indirect costs, and contingency.

Figure 2-13 **B1, Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers (preferred): General Project Location**

B2, Egmont Key Vegetation Management and Dune Retention (preferred)

Restoration Approach

Restore and conserve bird nesting and foraging habitat (PDARP/PEIS Section 5.5.12.2)

Restoration Technique

Enhance habitat through vegetation management (PDARP/PEIS Appendix 5.D.6.1)

Project Location

Egmont Key National Wildlife Refuge and Egmont Key State Park, Hillsborough County (Figure 2-14)

Project Summary

This project would be implemented by the DOI FL TIG Trustee in coordination with Egmont Key National Wildlife Refuge (EKNWR) staff. Other project partners include FDEP Florida Park Service (FDEP-FPS), Egmont Key State Park. This project would restore, protect, and enhance coastal wading bird, seabird, and shorebird nesting and foraging habitat on EKNWR through the removal of invasive vegetation, planting of native plant species, and subsequent reduction in shoreline erosion.

Specifically, this project would:

- **Remove invasive plants** by conducting chemical treatment and mechanical removal of coin vine (*Dalbergia ecastophyllum*) in areas that were, are, or could potentially be bird-nesting habitat (approximately 12 acres) and re-treat, where necessary, an additional 13 acres;
- **Restore and protect bird-nesting habitat** by planting native vegetation and installing sand fencing, where appropriate.

Coin vine has invaded bird nesting areas, displacing native plant communities typically found on coastal dunes and scrub/shrub zones. The coin vine infestation ranges from 40-100 percent cover on approximately 25 acres along the eastern shoreline of the island, forming dense, impenetrable thickets that have shaded out desirable nesting areas and degraded bird nesting and foraging habitat. EKNWR implemented Phase 1 of this project during 2019/2020, which included treatment of Category I and II invasive plants island-wide and chemical and mechanical removal of 13 acres of coin vine. Native plants were planted in areas where the coin vine was removed and included sea grape, sea oats, panic grass and other natives (railroad vine, dune sunflower and/or beach elder) as appropriate for diversity. Additionally, in 2019, USACE deposited 500 cubic yards of dredged material on the west side of the island to re-nourish part of the shoreline. Approximately 9 acres of beach habitat was created and then planted with native dune vegetation.

This project would treat or re-treat, as necessary, coin vine in areas that were, are, or could potentially be bird-nesting habitat or are immediately adjacent to these areas to prevent encroachment (approximately 25 acres) and to establish desirable native plants in its place. Species planted would vary depending on location, elevation, and hydrologic conditions but would likely include some or all of those listed above as well as cabbage palm. This project would also install sand fencing and additional plants where needed on the 9 acres of newly created beach habitat to reduce wind and wave erosion of that material (approximately 5 acres have already been lost to erosion).

Egmont Key supports approximately 33,000 nesting pairs of birds each year, including various wading birds, pelicans, black skimmers, American oystercatchers, laughing gulls, royal terns, and sandwich terns. Treatment and management of invasive plants has been identified as one of the highest priorities within the National Wildlife Refuge System to restore and protect native habitats. Restoring these areas to scrub/shrub, coastal grasses, and dunes species would increase available bird nesting habitat for species that were impacted by the DWH oil spill. Birds that would benefit from the project include brown pelicans, ibis, herons, egrets, and various sea- and shorebirds. In addition, this project is likely to provide ancillary benefits to sea turtles that nest on the island.

General Project Activities and Implementation Timing

Project activities include planning/design (permitting), implementation (non-construction and O&M), and monitoring. Implementation activities include chemical and mechanical control of coin vine, removal/burning of dead plant material (if feasible), and installation of sand fencing and native plants.

The project would commence with contract procurement and would be completed in approximately 5 years, including monitoring. Field activities would occur outside of bird and sea turtle nesting seasons to minimize project-related disturbance. Invasive plant control would occur September through February with native plant restoration occurring in February/March.

Maintenance

Short-term maintenance activities include inspection and irrigation, where practical, on new dune plantings to ensure adequate moisture during the initial establishment period, and stability of sand fencing and native plants. Plants would be fertilized at the time of installation with maintenance fertilization during the growing season until plants establish or spread enough to provide complete cover and stands retain good vigor after storm damage. Any invasive vegetation that become re-established would be removed by hand or chemical treatment, as needed.

USFWS and FDEP-FPS currently cooperatively manage Egmont Key including conducting invasive plant control and would continue to in the long-term after the project concludes. Therefore, no long-term maintenance activities are anticipated with project funds.

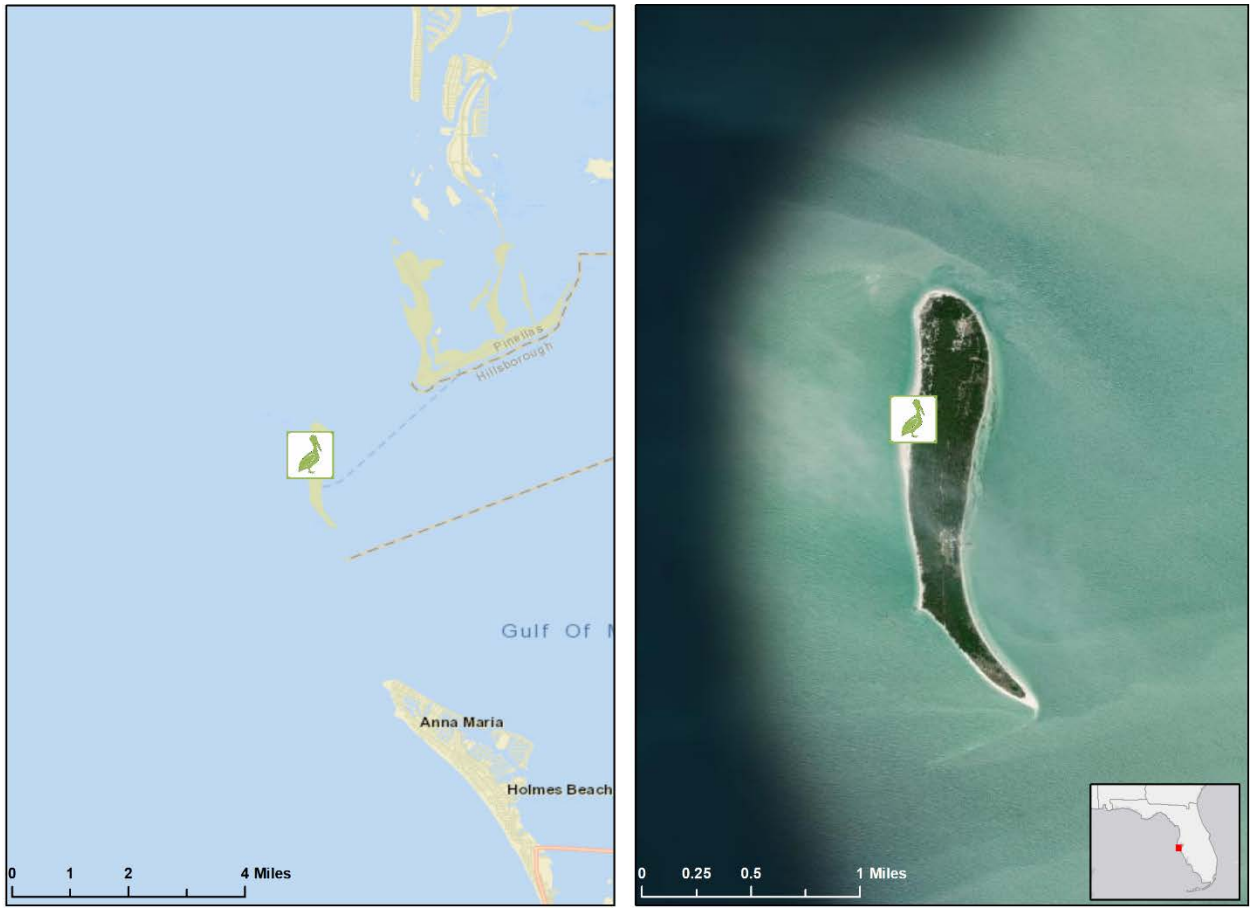
Project Monitoring

Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs

The total estimated costs are $466,143 which includes costs for planning, design, permitting, implementation, monitoring, oversight, and contingency.

Figure 2-14 **B2, Egmont Key Vegetation Management and Dune Retention (preferred): General Project Location**



B3, Northeast Florida Coastal Predation Management (preferred)

Restoration Approach

Restore and conserve bird nesting and foraging habitat (PDARP/PEIS Section 5.5.12.2)

Restoration Technique

Nesting and foraging area stewardship (PDARP/PEIS Appendix 5.D.6.1)

Project Location

Northeast Florida beaches and nearshore habitats with a focus on Nassau, Duval, and St. Johns Counties (Figure 2-15)

Project Summary

This project would be implemented by the FWC FL TIG Trustee. Project partners include FDEP-FPS, U.S. Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services (USDA-APHIS-WS), Guana Tolomato Matanzas National Estuarine Research Reserve, Northeast Florida aquatic preserves, St. Johns County, City of Jacksonville, and the NPS (Fort Matanzas National Monument). The goal of the project would be to implement predation management measures at critical nesting sites to increase breeding success for DWH-injured bird species such as state-threatened American oystercatchers, least terns, and black skimmers, as well as Wilson's plovers, a Species of Greatest Conservation Need.

This project leverages efforts of other projects including the DWH NRDA Enhanced Management of Avian Breeding Habitat Injured by Response Activities in the Florida Panhandle, Alabama, and Mississippi project and the NFWF-GEBF Restoring Florida's Shorebird & Seabird Populations project. This project facilitates timely, targeted predation management and associated monitoring to determine success, and would be implemented in an adaptive manner consistent with Florida's predation management efforts elsewhere in the state. This project would be conducted as an essential component of FWC's existing Florida Shorebird Program that includes posting shorebird nesting habitat, monitoring, stewarding, and law enforcement patrol efforts.

Specifically, the project would:

- **Develop annual lists of prioritized sites** for predation management based on:
    - Rates of nest and chick predation,
    - Relative contribution of a site to statewide productivity goals, and
    - Demonstrated success of prior predation management activities;
- **Conduct pre-season predator tracking** (using game cameras and individual observation) to determine movement of predator species known to impact nesting colonies;
- **Proactively manage predators through non-lethal methods** such as perch deterrents or removal of perches, trash management, predator effigies, and electric fence deployment/maintenance;
- **Conduct targeted lethal predation management** (e.g., coyote trapping, crow shooting) where specific predators have been documented to be causing damage to a nest site or nesting colony;
- **Coordinate and communicate internally** regarding site access and rapid response to emerging threats at active nesting sites;
- **Coordinate with on-going shorebird and seabird conservation activities**; and
- **Increasing public understanding** of predation management on Florida's beaches (e.g., installing educational materials around non-lethal predator measures such as crow effigies, goshawk traps in public spaces).

The goal of this project is to increase reproductive success and population size for Florida's focal shorebird and seabird species that were affected by the DWH oil spill through informed predation management at a minimum of four critical nesting sites in Northeast Florida. Banded bird resightings indicate that there is some connectivity between Atlantic and Gulf Coast populations of American oystercatchers, least terns, and black

skimmers therefore restoration activities that help to maintain Atlantic coast breeding sites could benefit Gulf Coast populations. Timely and targeted predation management actions would be conducted in an adaptive framework that would maximize the efficiency and efficacy of these efforts.

Predation negatively impacts shorebird and seabird nesting success, productivity, and population densities (Pruner 2011, Riensche 2007, Whittam and Leonard 1999). Although predation of bird nests and seabird colonies are part of a natural process, artificially inflated abundances of predators (e.g., due to human-subsidized food availability) would cause low population recruitment in some areas. These impacts are exacerbated by continued loss of beach-nesting bird habitat and increased disturbance, limiting reproductive success at critically important nesting sites.

Predation management would likely include locations where birds are nesting in proximity to sea turtles (e.g., Amelia Island State Park, George Crady Bridge Fishing Pier State Park, and Little Talbot Island State Park). Collectively all 3 sites can support anywhere from 40-120 sea turtle nests. Loggerhead sea turtles are most common but green, Kemp's ridley, and leatherbacks also nest on-site. Therefore, this project would likely also benefit sea turtle nests and hatchlings. Additionally, there is anecdotal evidence that predation management may benefit young gopher tortoises in the project area.

Progress continues to be made to enhance and restore nesting habitat and reduce human disturbance within those habitats through successful foundational shorebird conservation work completed through the NFWF-GEBF Restoring Florida's Shorebird & Seabird Populations project. However, in Northeast Florida the most common source of shorebird nest and seabird colony failure is predation (Florida Shorebird Database [FSD]), leading to catastrophic losses of nesting in this region.

General Project Activities and Implementation Timing

Project activities include implementation (non-construction) such as agency coordination, implementation of predation management activities, effort tracking, coordination with monitoring activities, and evaluation of project outcomes.

The project would be completed in 5 years. After the initial hiring and training period, approximately 3 months, project activities would be implemented each year that the project is active (Years 1–5).

Maintenance

Short-term maintenance activities would include making sure all non-lethal equipment (e.g., perch deterrents, electric fence materials, effigies), trapping equipment, firearms, and ammunition are secured, available as needed, cleaned regularly, and properly functioning. No long-term maintenance activities are anticipated.

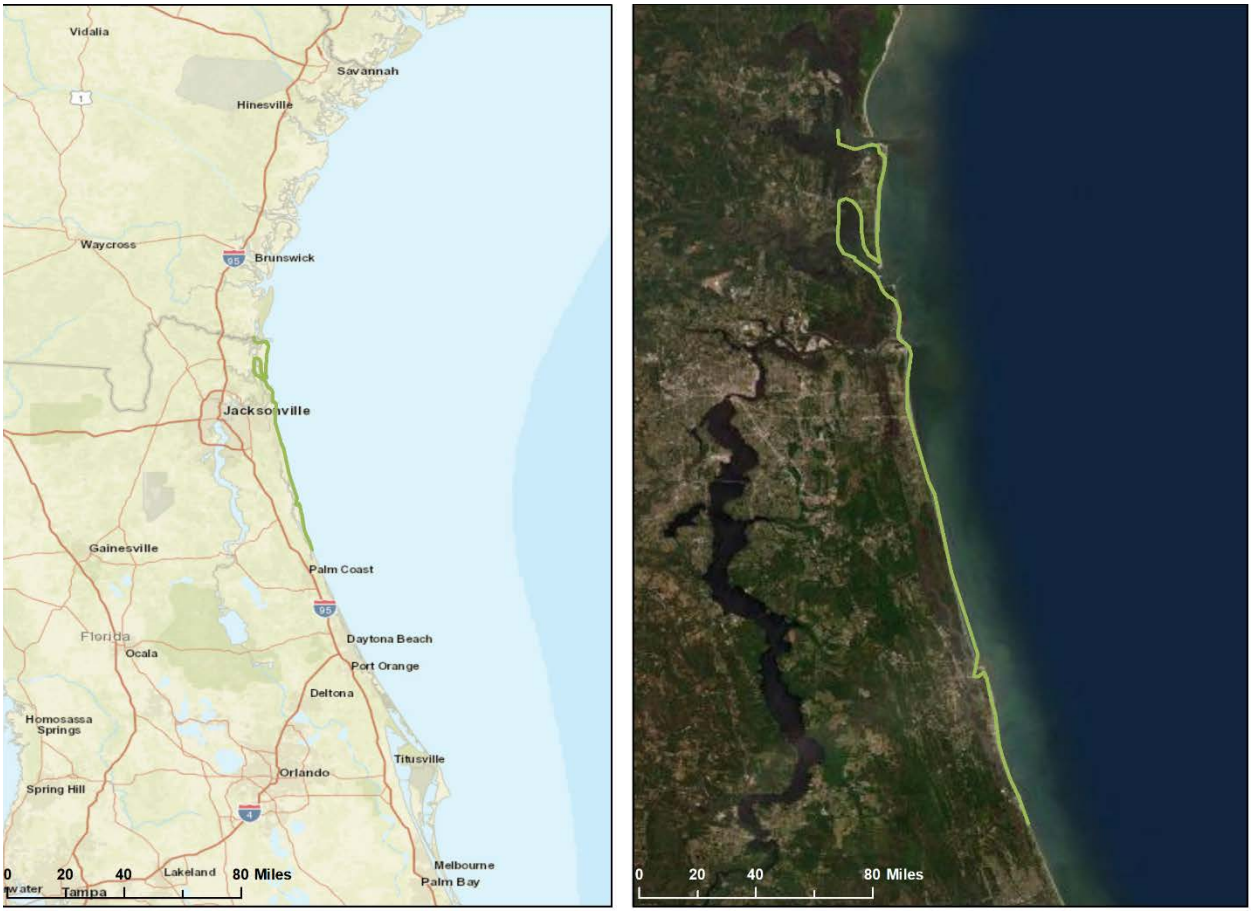
Project Monitoring

Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs

The total estimated costs are $449,295 which includes costs for implementation and indirect costs.

Figure 2-15 **B3, Northeast Florida Coastal Predation Management (preferred): General Project Location**



B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years (preferred)

Restoration Approach

Restore and conserve bird nesting and foraging habitat (PDARP/PEIS Section 5.5.12.2)

Restoration Technique

Nesting and foraging area stewardship (PDARP/PEIS Appendix 5.D.6.1)

Project Location

Florida Gulf Coast and select sites in Northeast Florida (Figure 2-16)

Project Summary

This project would be implemented by the FWC FL TIG Trustee. The project would continue and expand upon successful foundational shorebird conservation work by FWC and its key partner, Audubon Florida, to restore and protect Florida's shorebird and seabird species that were affected by the DWH oil spill. The FL TIG would coordinate implementation of this project with NFWF-GEBF and the RW TIG, which is currently planning restoration for birds.

The project would employ four strategies (reduce human disturbance, improve habitat quality, reduce predation, and improve regulatory coordination) to increase populations of focal species. Project activities would be informed and evaluated by coordinated adaptive management monitoring. The project would build on work completed through the DWH NRDA Enhanced Management of Avian Breeding Habitat Injured by Response Activities in the Florida Panhandle project and help continue the work being implemented through the NFWF-GEBF Restoring Florida's Shorebird & Seabird Populations project. This project would focus specifically on the following species: black skimmer, least tern, American oystercatcher, Wilson's plover, and snowy plover. These focal species are among 13 species that breed in Florida that were impacted by the spill and would benefit from this project.

Specifically, the proposed NRDA-funded component of the project would:

- **Reduce human disturbance:**
    - Implement strategies such as posting nesting, brood-rearing, and sensitive feeding habitats with symbolic fencing and/or signage;
    - Conduct outreach and education activities including social media campaigns, targeted messaging, educating beachgoers about conserving and protecting birds, and stewardship activities to ensure compliance and education about posted and protected areas[40];
    - Training of and coordination with law enforcement;
- **Improve habitat quality:**
    - Assist landowners, local governments, and resource management agencies by promoting best management practices (BMPs);
    - Secure funding and develop plans for future habitat restoration and creation efforts. Address activities on beaches that are incompatible with nesting birds by establishing protected areas, reducing mechanical beach cleaning, limiting beach driving, and addressing conflicts with feral cat colonies;
    - Work with volunteers and partners to coordinate rooftop management (the primary nesting site of least terns in Florida; 55 percent of the statewide population in 2019), engage with building owners and managers to reduce conflict, and involve FWC law enforcement officers when take is imminent or where it has occurred;

[40] Through the Florida Shorebird Alliance (FSA), FWC strives for comprehensive monitoring coverage and post nests that are vulnerable to human disturbance. The FWC-designated Critical Wildlife Areas, which support some of the most vulnerable beach-nesting bird sites, receive particular attention. Stewarding, outreach, and coordination with local governments are important for managing conflicts and minimizing disturbance.

- **Reduce predation**[41]**:**
    - Implement predation management at priority nesting sites within an adaptive framework maximizing efficiency and efficacy. Predation management would include lethal (e.g., coyote trapping, crow shooting) and nonlethal (e.g., perch deterrents, effigies, trash management) approaches implemented by a combination of project staff, partners, and the USDA-APHIS-WS. Efforts would be focused on priority sites identified annually in a statewide predation management plan. The prioritization process would be informed by data in the FSD and productivity data from nesting sites;
    - Increase monitoring where data on productivity rates or cause-specific sources of nest loss are insufficient;
    - Evaluate effectiveness of predation management activities by documenting productivity outcomes at sites;
    - Develop partnerships with conservation efforts for other imperiled taxa (e.g., beach mice, sea turtles) that may benefit from predation management;
    - Work with FWC public relations to increase stakeholder support for predation management;
- **Improve regulatory coordination:** FWC has regulatory authority for wildlife in Florida, and the agency coordinates with other regulatory agencies to address impacts of development, beach management practices, coastal engineering, and other beach modification projects. Coordination activities include:
    - Provide comments on projects permitted by other agencies, recommending permit conditions to minimize and avoid impacts, and engaging with project managers on implementation of permit conditions to ensure compliance;
    - Finalize and implement Species Conservation Measures and Permitting Guidelines for Florida's four state-threatened beach-nesting birds. The guidelines would provide stakeholders with a framework for how to avoid take and how to minimize and mitigate for take that is unavoidable;
- **Adaptive management and monitoring:**
    - Use monitoring data to revise FWC's Shorebird Program goals and evaluate the cost-effectiveness of our conservation strategies;
    - Collect monitoring data to fill critical knowledge gaps, including productivity levels needed to meet conservation goal and the threats facing rooftop colonies. This information is needed to refine our monitoring efforts to measure our progress toward recovery of rooftop species (i.e., least terns and black skimmers) and to improve the efficiency and effectiveness of our management actions;
    - Provide standardized data collection protocols, coordinate with partners statewide to ensure coverage, provide a centralized data repository (the FSD), train partners on use of the protocols and database, employ technicians to monitor and manage FWC Critical Wildlife Areas, and provide partners with continual support and follow-up throughout the nesting season;
    - Synthesize data from a variety of partners to develop a robust statewide understanding of the life-stages limiting population growth of our focal species;
    - Collaborate with local and out-of-state partners and disseminate the Shorebird Program methods and results to local, regional, national, and international stakeholders in the form of presentations, manuscripts in peer-reviewed journals, reports, and outreach.

The goal of this project is to increase reproductive success and population size for Florida's focal shorebird and seabird species through stewardship activities at important nesting and foraging areas. This project would help continue the successful shorebird conservation work currently being implemented through the NFWF-GEBF

[41] Although the B3, Northeast Florida Coastal Predation Management and B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years projects overlap geographically, predation management activities under B4 would not take place in Northeast Florida. Rather, it would provide staffing and monitoring needed to effectively implement B3.

Restoring Florida's Shorebird & Seabird Populations project and would help compensate for injuries to shorebird and seabird species from the DWH oil spill.
General Project Activities and Implementation Timing
Project activities include implementation (non-construction) and monitoring. The proposed work is likely to be funded through NFWF-GEBF until December 2023. As such, the FL TIG is proposing a 5-year project that would be part of a larger 10-year project that is beginning in January 2024, with initial anticipated support from NFWF-GEBF and other DWH restoration funds resulting in substantial FL TIG expenditures not beginning until later in the project 10-year cycle.
Maintenance
Short-term maintenance activities would include maintaining vehicles and equipment, maintaining posted sites by keeping fencing, signage in place, maintaining chick-proofing on rooftops, and keeping predation management materials (perch deterrents, effigies, trashcans, etc.) functioning properly. No long-term maintenance activities are anticipated.
Project Monitoring
Project monitoring details can be found in the project's MAM plan located in Appendix B.
Costs
The total estimated costs are $10,500,000 which includes costs for implementation, monitoring, oversight, and indirect costs. The FL TIG funding request would be used to leverage other DWH funding sources to provide 10 years of funding for program activities.

Figure 2-16 B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years (preferred): General Project Location

B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years

Restoration Approach

Restore and conserve bird nesting and foraging habitat (PDARP/PEIS Section 5.5.12.2)

Restoration Technique

Nesting and foraging area stewardship (PDARP/PEIS Appendix 5.D.6.1)

Project Location

Florida Gulf Coast and select sites in Northeast Florida (Figure 2-17)

Project Summary

This project would be implemented by the FWC FL TIG Trustee. The project would continue and expand upon successful foundational shorebird conservation work by FWC and its key partner, Audubon Florida, to restore and protect Florida's shorebird and seabird species that were affected by the DWH oil spill. FWC's efforts on this project would leverage work being funded by NFWF-GEBF.

The project would employ four strategies (reduce human disturbance, improve habitat quality, reduce predation, and improve regulatory coordination) to increase populations of focal species. Project activities would be informed and evaluated by coordinated adaptive management monitoring. The project would build on work completed through the DWH NRDA Enhanced Management of Avian Breeding Habitat Injured by Response Activities in the Florida Panhandle project and help continue the work being implemented through the NFWF-GEBF Restoring Florida's Shorebird & Seabird Populations project. This project would focus specifically on the following focal species: black skimmer, least tern, American oystercatcher, Wilson's plover, and snowy plover. These focal species are among 13 species that breed in Florida that were impacted by the spill and would benefit from this project.

Specifically, the proposed NRDA-funded component of the project would:

- **Reduce human disturbance:**
    - Implement strategies such as posting nesting, brood-rearing, and sensitive feeding habitats with symbolic fencing and/or signage;
    - Conduct outreach and education activities including social media campaigns, targeted messaging, educating beachgoers about conserving and protecting birds, and stewardship activities to ensure compliance and education about posted and protected areas[42];
    - Training of and coordination with law enforcement;
- **Improve habitat quality:**
    - Assist landowners, local governments, and resource management agencies by promoting BMPs;
    - Secure funding and develop plans for future habitat restoration and creation efforts. Address activities on beaches that are incompatible with nesting birds by establishing protected areas, reducing mechanical beach cleaning, limiting beach driving, and addressing conflicts with feral cat colonies;
    - Work with volunteers and partners to coordinate rooftop management (the primary nesting site of least terns in Florida; 55 percent of the statewide population in 2019), engage with building owners and managers to reduce conflict, and involve FWC law enforcement officers when take is imminent or where it has occurred;

[42] Through the FSA, FWC strives for comprehensive monitoring coverage and post nests that are vulnerable to human disturbance. The FWC-designated Critical Wildlife Areas, which support some of the most vulnerable beach-nesting bird sites, receive particular attention. Stewarding, outreach, and coordination with local governments are important for managing conflicts and minimizing disturbance.

- **Reduce predation[43]:**
    - Implement predation management at priority nesting sites within an adaptive framework that would maximize efficiency and efficacy. Predation management would include lethal (e.g., coyote trapping, crow shooting) and nonlethal (e.g., perch deterrents, effigies, trash management) approaches implemented by a combination of project staff, partners, and the USDA-APHIS-WS. Efforts would be focused on priority sites identified annually in a statewide predation management plan. The prioritization process would be informed by data in the FSD and productivity data from nesting sites;
    - Increase monitoring where data on productivity rates or cause-specific sources of nest loss are insufficient;
    - Evaluate effectiveness of predation management activities by documenting productivity outcomes at sites;
    - Develop partnerships with conservation efforts for other imperiled taxa (e.g., beach mice, sea turtles) that may benefit from predation management;
    - Work with FWC public relations to increase stakeholder support for predation management;
- **Improve regulatory coordination:** FWC has regulatory authority for wildlife in Florida, and the agency coordinates with other regulatory agencies to address impacts of development, beach management practices, coastal engineering, and other beach modification projects. Coordination activities include:
    - Provide comments on projects permitted by other agencies, recommending permit conditions to minimize and avoid impacts, and engaging with project managers on implementation of permit conditions to ensure compliance;
    - Finalize and implement Species Conservation Measures and Permitting Guidelines for Florida's four state-threatened beach-nesting birds. The guidelines would provide stakeholders with a framework for how to avoid take and how to minimize and mitigate for take that is unavoidable;
- **Adaptive management and monitoring:**
    - Use monitoring data to revise FWC's Shorebird Program goals and evaluate the cost-effectiveness of our conservation strategies;
    - Collect monitoring data to fill critical knowledge gaps, including productivity levels needed to meet conservation goal and the threats facing rooftop colonies. This information is needed to refine our monitoring efforts to measure our progress toward recovery of rooftop species (i.e., least terns and black skimmers) and to improve the efficiency and effectiveness of our management actions;
    - Provide standardized data collection protocols, coordinate with partners statewide to ensure coverage, provide a centralized data repository (the FSD), train partners on use of the protocols and database, employ technicians to monitor and manage FWC Critical Wildlife Areas, and provide partners with continual support and follow-up throughout the nesting season;
    - Synthesize data from a variety of partners to develop a robust statewide understanding of the life-stages limiting population growth of our focal species;
    - Collaborate with local and out-of-state partners and disseminate the Shorebird Program methods and results to local, regional, national, and international stakeholders in the form of presentations, manuscripts in peer-reviewed journals, reports, and outreach.

The goal of this project is to increase reproductive success and population size for Florida's focal shorebird and seabird species through stewardship activities at important nesting and foraging areas. This project would help continue the successful shorebird conservation work currently being implemented through the NFWF-GEBF

[43] Although the B3, Northeast Florida Coastal Predation Management and B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years projects overlap geographically, predation management activities under B4 would not take place in Northeast Florida. Rather, it would provide staffing and monitoring needed to effectively implement B3.

Restoring Florida's Shorebird & Seabird Populations project and would help compensate for injuries to shorebird and seabird species from the DWH oil spill.
General Project Activities and Implementation Timing
Project activities include implementation (non-construction) and monitoring. The proposed work is likely to be funded through NFWF-GEBF until December 2023. As such, the FL TIG proposes a 10-year project beginning in January 2024.
Maintenance
Short-term maintenance activities would include maintaining vehicles and equipment, maintaining posted sites by keeping fencing, signage in place, maintaining chick-proofing on rooftops, and keeping predation management materials (perch deterrents, effigies, trashcans, etc.) functioning properly. No long-term maintenance activities are anticipated.
Project Monitoring
This project has not been identified as a preferred alternative by the FL TIG in this RP/EA, therefore, a project MAM plan has not been developed.
Costs
The total estimated costs are $21,000,000 which includes costs for implementation, monitoring, oversight, and indirect costs.

Figure 2-17 B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years: General Project Location

2.5.5 Project Descriptions: Provide and Enhance Recreational Opportunities

This RP/EA identifies nine restoration alternatives consistent with the Provide and Enhance Recreational Opportunities Restoration Goal (PDARP/PEIS Section 5.3.1) and the underlying Provide and Enhance Recreational Opportunities Restoration Type (PDARP/PEIS Section 5.5.14).

1. Pensacola Community Maritime Park Public Fishing Marina (preferred);
2. Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades (preferred);
3. Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements (preferred);
4. Gulf Breeze Parks Boating and Fishing Access Upgrades (preferred);
5. Lincoln Park Boat Ramp and Dock Improvements (preferred);
6. St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred)[44];
7. St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass;
8. Florida Artificial Reef Creation and Restoration – Phase 2 (preferred); and
9. Apollo Beach Recreational Sportfish Hatchery Facility (preferred).

A description of each of these restoration alternatives is provided below.

[44] This project is jointly proposed and described under two Restoration Types: Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities.

REC1, Pensacola Community Maritime Park Public Fishing Marina (preferred)

Restoration Approach

Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2)

Restoration Technique

N/A (see PDARP/PEIS Appendix 5.D.8.1)

Project Location

Community Maritime Park, Pensacola (Figure 2-18)

Project Summary

This project would be implemented by the FWC FL TIG Trustee in coordination with the City of Pensacola. Currently, all fishing tournaments are located at private facilities/marinas such as the Pensacola Yacht Club and Grande Lagoon Yacht Club. The primary purpose of the proposed project is to support public and charity (e.g., fundraising) fishing tournaments[45] by constructing a public marina. When not in use in support of fishing events, the marina would be available to the public for day-use vessels only as permitted by USACE.

Specifically, this project would:

- **Construct a designed and permitted 48-vessel slip public fishing marina** (i.e., day use only) with three floating piers and kayak launch to help increase recreational fishing in Pensacola Bay and the Gulf;
- **Provide educational information** (e.g., markers, kiosks at dock) focusing on habitat conservation through pollution reduction, Pensacola's maritime history, and invasive species education.
- **Install monofilament recycling bins** at the marina.

This project would utilize a breakwater that has already been built to protect the marina, which would minimize erosion in the boat basin and lessen the need for future dredging. Any lighting associated with the marina would be implemented in accordance with sea turtle lighting best practices. The marina would increase opportunities for the public to access natural resources, thereby helping to compensate for interim losses to recreational use by the DWH oil spill.

General Project Activities and Implementation Timing

Project activities include implementation (construction) and monitoring.

The project would be completed in approximately 4 years. Years 1-2 would include construction activities. Years 3-4 would include post-construction monitoring of the recreational use by FWC.

Maintenance

Inspection and maintenance of amenities in the short- and long-term maintenance activities would be provided by the City.

Project Monitoring

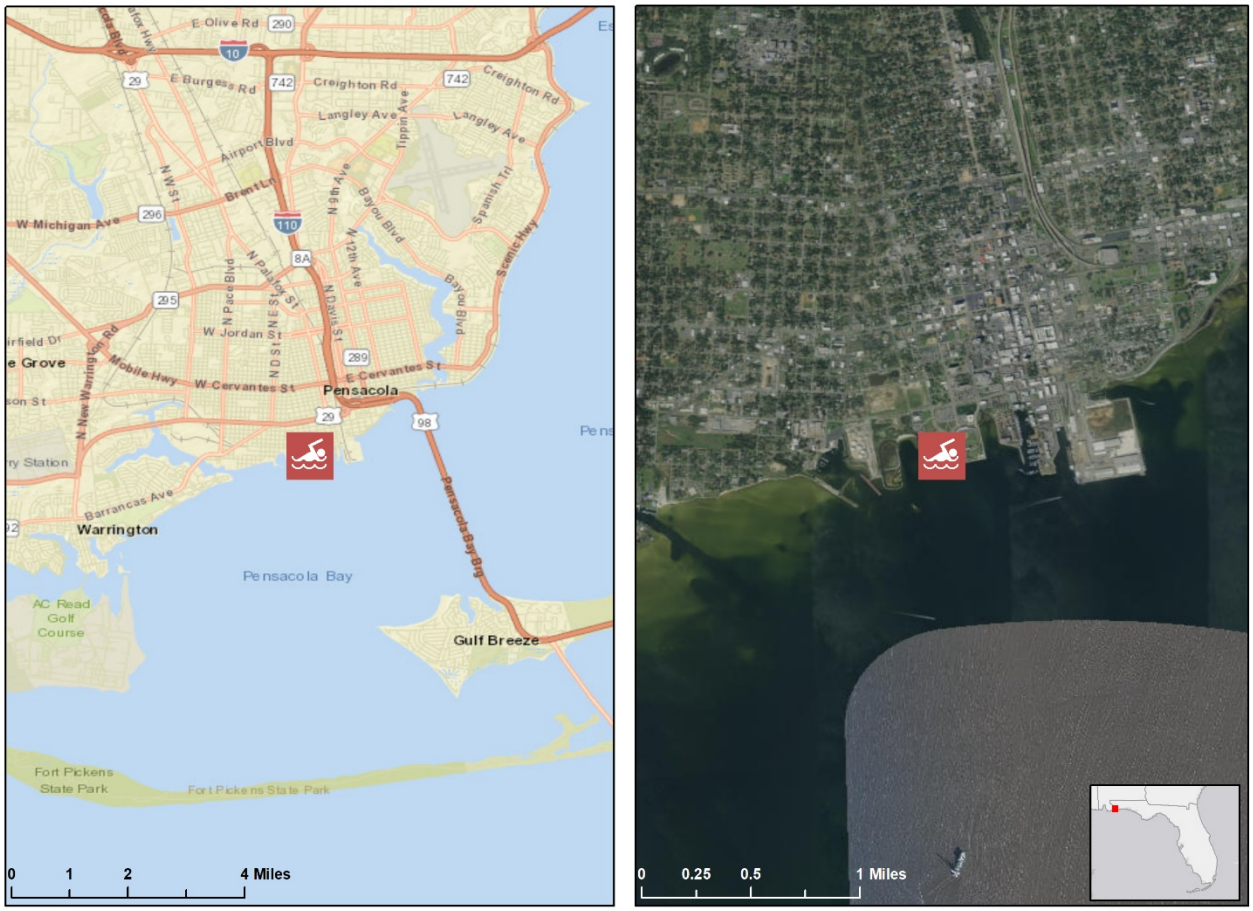
Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs

The total estimated costs are $3,190,502 which includes costs for implementation, oversight, indirect costs, and contingency.

[45] This project would provide additional boat slips for charity fishing tournaments such as Pensacola International Billfish Tournament, Pensacola Ladies Billfish Tournament, Pensacola Juniors Billfish Tournament, and Bill Hargreaves Fishing Rodeo, among others.

Figure 2-18 **REC1, Pensacola Community Maritime Park Public Fishing Marina (preferred): General Project Location**



REC2, Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades (preferred)

Restoration Approach
Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2)
Restoration Technique
N/A (see PDARP/PEIS Appendix 5.D.8.1)
Project Location
Baars Park and Sanders Beach, Pensacola (Figure 2-19)
Project Summary

This project would be implemented by the FWC FL TIG Trustee in coordination with the City of Pensacola. This project would enhance/increase access to Pensacola waterways for kayak fishing and paddling by establishing a designated kayak fishing and paddling trail starting at Baars Park and ending at Sanders Beach. Kayak fishing is the fastest growing segment of the U.S. sportfishing market due to increasing fuel costs, expense compared to other watercraft, minimal environmental impacts, and growing appreciation for an active outdoor lifestyle. Pensacola offers tourism amenities that market its natural resources to outdoor recreation enthusiasts as a nature-based tourism destination, resulting in economic stimulus and increased public awareness of natural Pensacola.

Specifically, this project would:

- **Establish trailhead-related infrastructure at Baars Park**.
    - Construct a fishing pier and dock with specialized kayak and accessible entry. Any lighting associated with the pier and dock would be implemented in accordance with applicable sea turtle lighting best practices;
    - Construct a small, unpaved parking lot with approximately eight parking spaces;
    - Construct a picnic area/shelter[46];
    - Install monofilament recycling bins;
    - Install informational (e.g., navigational) and educational kiosks;
- **Enhance existing infrastructure at Sanders Beach**.
    - Convert the existing powercraft launch to an accessible kayak launch;
    - Install floating accessible kayak launches to the two existing docks;
    - Reconfigure, and possibly expand, the existing parking lot;
    - Install monofilament recycling bins;
    - Install informational (e.g., navigational) and educational kiosks.

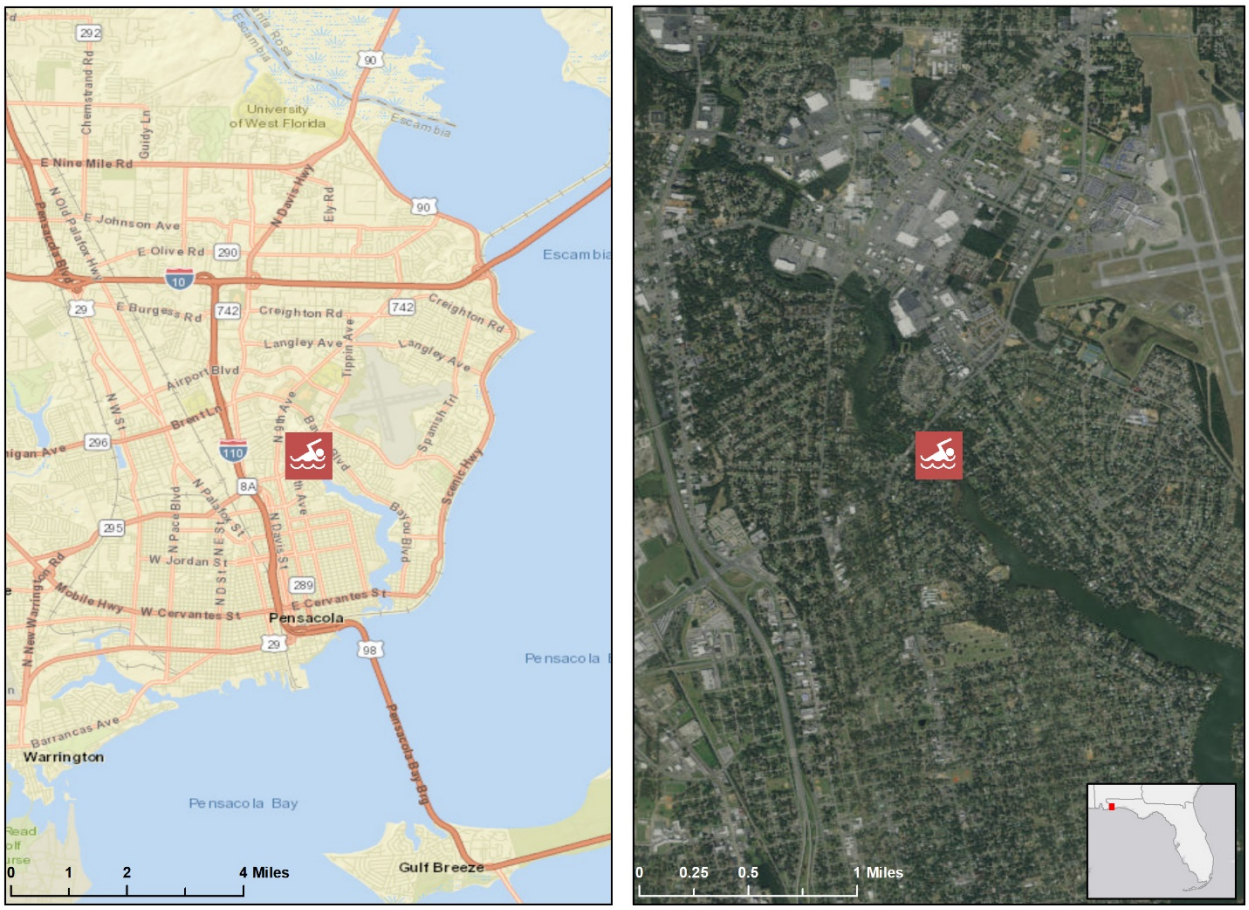
The goal of this project is to provide enhanced/increased access to Pensacola waterways for kayak fishing and paddling through the addition of much needed infrastructure, while continuing to invest in nature-based tourism. Pensacola is participating in an effort to establish and connect a designated kayak fishing/paddling trail to support continued growth and enhance fishing infrastructure. Additional public access points are integral to Pensacola's long-term strategy for environmental education and would increase opportunities for the public to access natural resources, thereby helping to compensate for interim losses to recreational use by the DWH oil spill.

Further, this effort brings together local community and conservation leaders and fishing communities and promotes inter-agency cooperation, public stakeholder involvement, and integrated management of coastal natural resources. The City is working with local and state groups on a trail-designation process incorporating public input.

[46] Final inclusion of this amenity would be subject to public input.

General Project Activities and Implementation Timing
Project activities include planning/design (E&D and permitting), implementation (construction), and monitoring. The City manages over 90 parks with varying amenities, only a few of which are adjacent to water suited for motorized or non-motorized vessels. Each location provides a serene site for relaxation and is visually appealing due to the use of softscape consisting of native species. The City would implement these best practices proven successful at other city-managed parks. To better assist mobility-impaired enthusiasts, the City would select vendors based on innovative approaches and those who use effective products to assist users with entering and exiting the waterways. The project would be completed in approximately 4 years. Year 1 would include planning, E&D, and permitting of the amenities. Year 2 would include construction activities. Years 3-4 would include post-construction monitoring of recreational use by FWC.
Maintenance
Inspection and maintenance of amenities in the short- and long-term would be provided by the City.
Project Monitoring
Project monitoring details can be found in the project's MAM plan located in Appendix B.
Costs
The total estimated costs are $1,402,531 which includes costs for planning, design, permitting, implementation, oversight, indirect costs, and contingency.

Figure 2-19 REC2, Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades (preferred): General Project Location



REC3, Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements (preferred)

Restoration Approach

Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2)

Restoration Technique

N/A (see PDARP/PEIS Appendix 5.D.8.1)

Project Location

Park West, Pensacola Beach (Figure 2-20)

Project Summary

This project would be implemented by the FDEP FL TIG Trustee in coordination with Escambia County. The project goal is to complete E&D of a new fishing pier and other amenities on Pensacola Beach to enhance/increase recreational fishing opportunities.

Specifically, this project would:

- **Conduct E&D and permit a new ADA-accessible fishing pier**. Conceptually, the pier is anticipated to be between 600-800 feet in length;
- **Conduct E&D and permit additional access improvements** including, but not limited to, parking, pedestrian crossings, beach and water access to Santa Rosa Sound, an ADA-accessible kayak launch, and signage.

The County would incorporate efficient, effective, and maintainable green infrastructure solutions where feasible, and any lighting associated with the project would be designed to adhere to the requirements of the Pensacola Beach Lighting Ordinance and incorporate sea turtle friendly lighting best practices.

This project would enhance/increase opportunities for the public to access natural resources by creating new water access sites, constructing a new fishing pier, and improving access for mobility-limited recreators through compliance with ADA standards, thereby helping to compensate for interim losses to recreational use by the DWH oil spill.

General Project Activities and Implementation Timing

Project activities include planning/design (E&D and permitting). The project would be completed in approximately 2 years.

Maintenance

There is no short- or long-term maintenance associated with this project given it is E&D only.

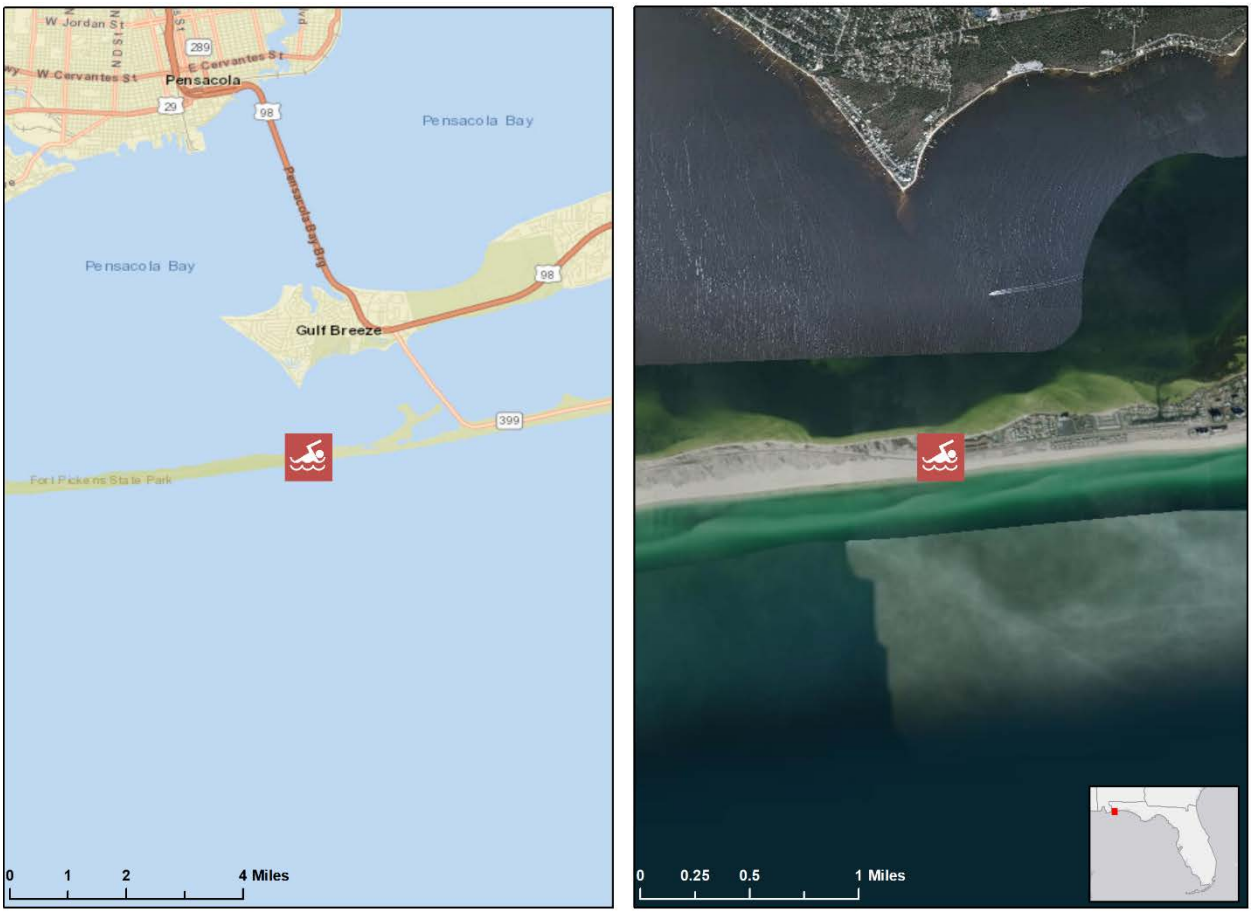
Project Monitoring

Consistent with Section 10 of the Trustee Council's SOPs (DWH Trustees 2016b), a MAM plan is not required for projects with only E&D activities, and therefore a MAM plan for this project has not been developed.

Costs

The total estimated costs are $353,100 which includes costs for planning, design, permitting, oversight, and contingency.

Figure 2-20 **REC3, Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements (preferred): General Project Location**



REC4, Gulf Breeze Parks Boating and Fishing Access Upgrades (preferred)

Restoration Approach

Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2)

Restoration Technique

N/A (see PDARP/PEIS Appendix 5.D.8.1)

Project Location

Shoreline Park South, Woodlands Park, and Vista Park, Gulf Breeze (Figure 2-21)

Project Summary

This project would be implemented by the FWC FL TIG Trustee in coordination with the City of Gulf Breeze. The goal of the project is to enhance/increase recreational fishing opportunities for residents and tourists by renovating three of the City's existing parks (Shoreline Park South, Woodlands Park, and Vista Park). The project would construct new and enhance existing amenities to provide access and improve the overall fishing experience for people of all ages and abilities.

Specifically, this project would:

- **Enhance Shoreline Park South**:
    - Demolish the existing fishing pier (which was damaged by Hurricane Sally) and construct an expanded fishing pier in the same location to increase foot traffic and to accommodate the mooring of fishing vessels;
    - Renovate the boat launches;
    - Construct a small vessel/fishing boat launch with a floating dock, fish cleaning station, and refresh station for fisherman with ice, vending, and frozen bait machines;
    - Improve/enhance parking, utilities, and security;
    - Install additional monofilament recycling bins, if necessary;
- **Enhance Woodlands Park**:
    - Demolish the existing dock and pier and construct a new floating pier, dock, and kayak launch in a new location;
    - Construct a new ADA-compliant restroom facility;
    - Install monofilament recycling bins;
    - Expand parking and a concrete walk to connect the improvements to the existing facilities;
- **Enhance Vista Park**:
    - Construct a small vessel/fishing boat launch with a floating dock;
    - Install monofilament recycling bins;
    - Construct a concrete walk connecting to existing park.

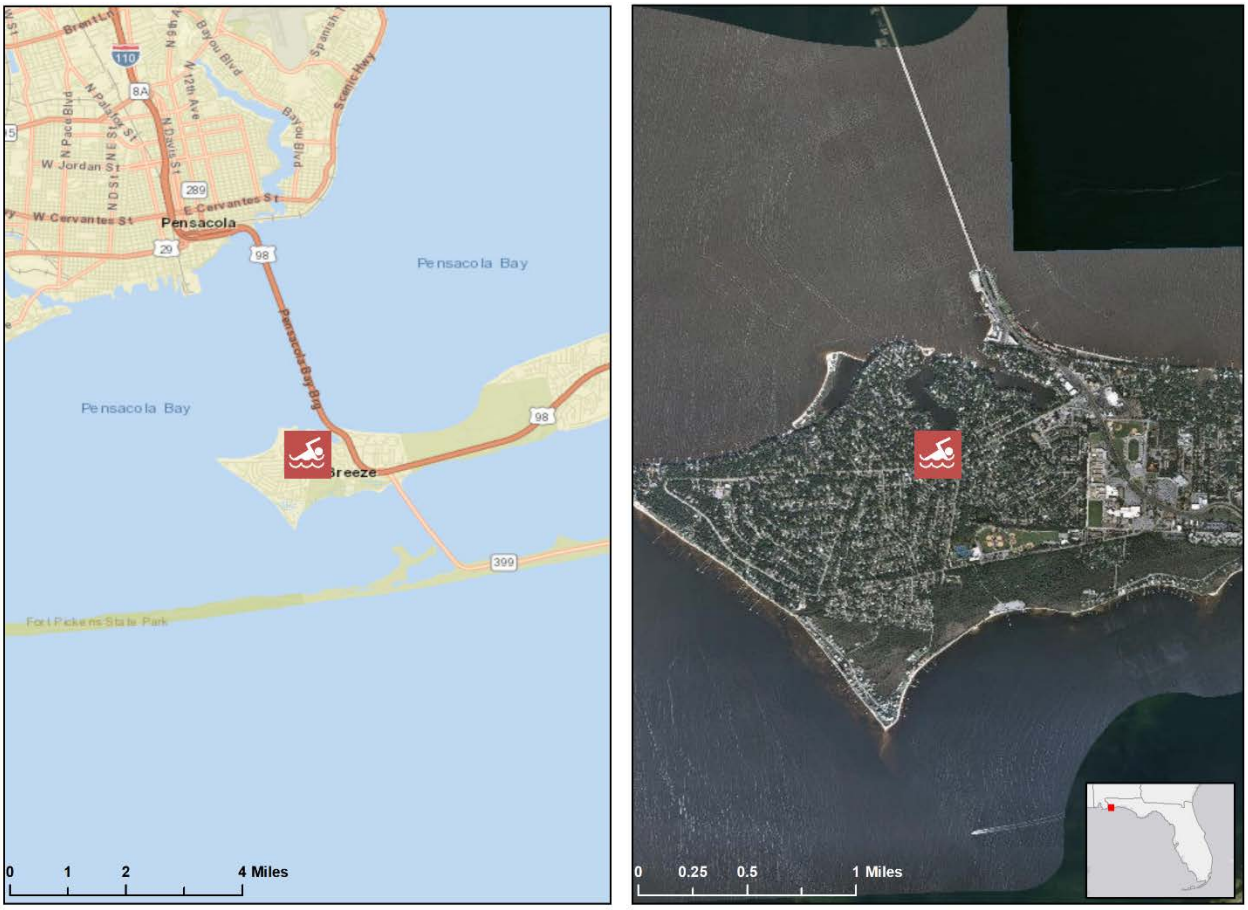
This project would enhance/increase opportunities for the public to access natural resources, thereby helping to compensate for interim losses to recreational use by the DWH oil spill.

General Project Activities and Implementation Timing

Project activities include planning/design (E&D), implementation (construction), and monitoring. The project would use best practices in the design and building of the project to mitigate potential dangers from hurricanes, storm surges, and shoreline erosion. Further, the project would adhere to all local, state, and federal regulations regarding building codes, wetlands, wildlife, and shoreline construction. In particular, if lighting is incorporated into the project, it would be implemented in accordance with the applicable sea turtle friendly lighting best practices. The City, through citizen engagement and staff recommendations, developed this project for improving waterfront facilities to promote and encourage recreational fishing.

The project would be completed in approximately 4 years. Year 1 would include planning/design. Year 2 would include construction activities. Years 3-4 would include post-construction monitoring of recreational use by FWC.
Maintenance
Inspection and maintenance of amenities in the short- and long-term would be provided by the City.
Project Monitoring
Project monitoring details can be found in the project's MAM plan located in Appendix B.
Costs
The total estimated costs are $1,221,660 which includes costs for planning, design, implementation, oversight, indirect costs, and contingency.

Figure 2-21 REC4, Gulf Breeze Parks Boating and Fishing Access Upgrades (preferred): General Project Location



REC5, Lincoln Park Boat Ramp and Dock Improvements (preferred)

Restoration Approach

Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2)

Restoration Technique

N/A (see PDARP/PEIS Appendix 5.D.8.1)

Project Location

Lincoln Park, Valparaiso (Figure 2-22)

Project Summary

This project would be implemented by the FWC FL TIG Trustee in coordination with the City of Valparaiso. Lincoln Park, located on North Bayshore Drive, is owned and operated by the City. The park currently hosts public access facilities including swimming areas, picnic areas, restrooms, showers, a playground area, parking, an access pier, and two single-lane boat ramps. The existing concrete boat ramps have experienced undermining, concrete deterioration, and sedimentation that poses public safety hazards, hinders access, and requires routine maintenance by the City. The goal of this project is to improve the boat ramps and access docks to increase efficiency of temporary mooring, reduce potential impact to nearby seagrasses, and enhance safe recreational access to Boggy Bayou. The project would also repair and expand the existing unpaved parking lot.

Specifically, this project would:

- **Replace the existing single-lane boat ramps** with one re-designed two-lane boat ramp that incorporates elements to increase resiliency and design-life of the ramp;
- **Replace a central pier** with two flanking access docks;
- **Repair and expand the existing unpaved parking lot**; and
- **Install monofilament recycling bins**.

This project would enhance/increase opportunities for the public to access natural resources, thereby helping to compensate for interim losses to recreational use by the DWH oil spill.

General Project Activities and Implementation Timing

Planning and preliminary E&D have been completed. E&D, preparation of construction documents, and bidding/procurement should be completed in 2021 and are being paid with non-NRDA funds. Project activities include implementation (construction) and monitoring.

The project would be completed in approximately 3 years. Construction would occur in Year 1 followed by post-construction monitoring of recreational use by FWC in Years 2-3.

Maintenance

Inspection and maintenance of amenities in the short- and long-term would be provided by the City.

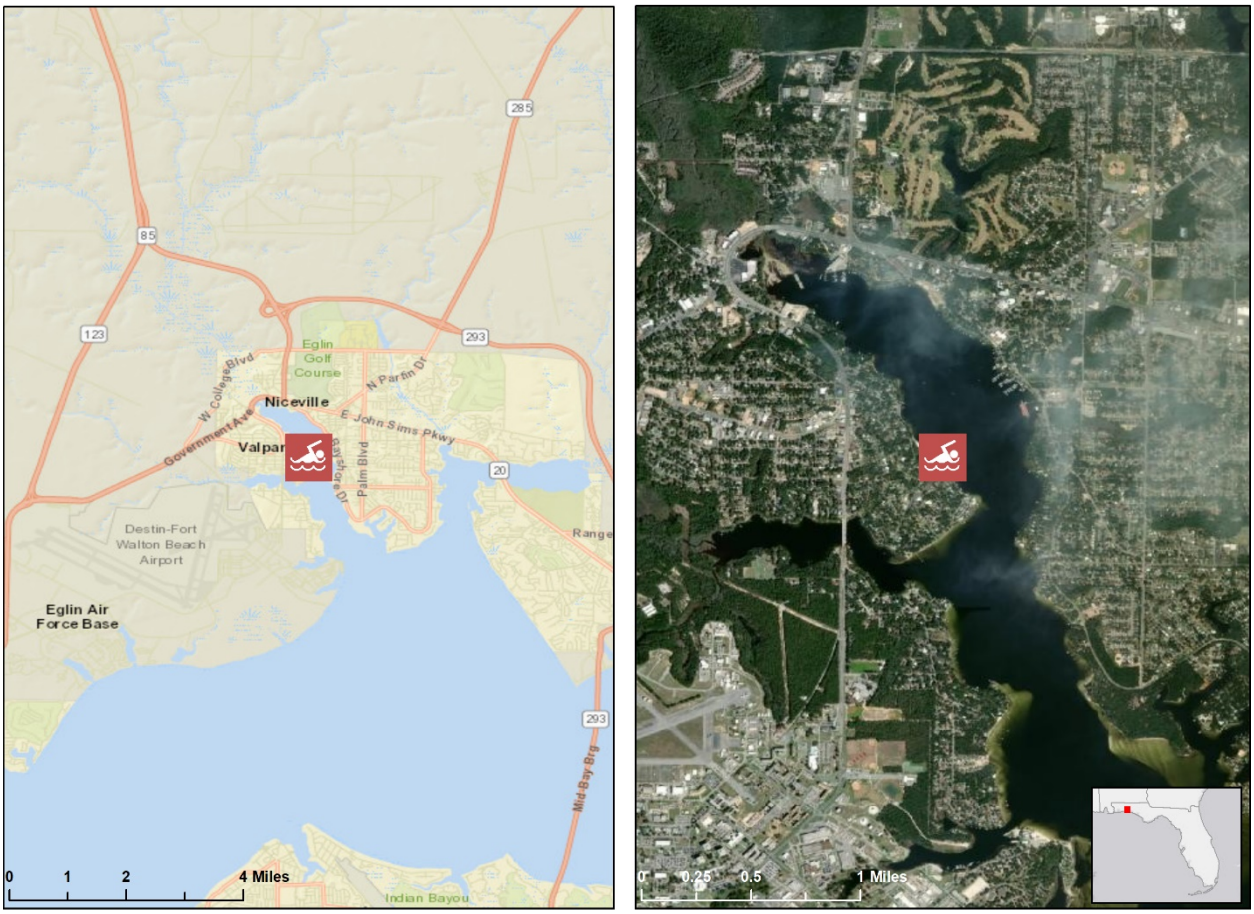
Project Monitoring

Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs

The total estimated costs are $457,500 which includes costs for implementation, oversight, indirect costs, and contingency.

Figure 2-22 REC5, Lincoln Park Boat Ramp and Dock Improvements (preferred): General Project Location



FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred)

Restoration Approach

Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2)

Restoration Technique

N/A (see PDARP/PEIS Appendix 5.D.8.1)

Project Location

Indian Pass Campground, Gulf County (Figure 2-23)

Project Summary

This project would be implemented by FWC and DOI FL TIG Trustees, in coordination with USFWS-SVNWR, Gulf County, and Friends of SVNWR. The goal of the project is to acquire and enhance a 10-15-acre parcel at Indian Pass to secure boating access to the SVNWR in perpetuity and enhance recreational opportunities.

Specifically, the project would:

- **Acquire a 10-15-acre parcel at Indian Pass** for inclusion in SVNWR (this would be partially funded under the Habitat Projects of Federally Managed Lands Restoration Type [Section 2.5.1]);
- **Increase vehicle/trailer unpaved parking** at the existing boat ramp from approximately 14 to 31 spaces and add monofilament fishing line recycling bins;
- **Convert the campground store to a visitor contact station** for the SVNWR;
- **Establish a kayak boat launch** area with 10 unpaved parking spaces.

Indian Pass and Indian Lagoon provide high-quality natural fish and wildlife habitat. The project would enhance public recreation in an area of the Panhandle being developed very quickly. Acquisition and enhancement of these ecologically important lands would improve public recreational access for surf and shoreline fishing for seatrout, redfish, and flounder while providing new water access amenities for paddlecraft. Commercial crabbers, oystermen, and workers in the burgeoning aquaculture industry would benefit from enhanced boat ramp amenities, as well as enhanced water quality from protected coastal habitats. Construction of additional public parking space in a developing area would provide anglers greater recreational access to offshore fishing opportunities for popular Gulf reef fish such as red snapper and grouper.

This would be the first time in history that SVNWR would have a contact station in sight of the island. This would improve visitor education and access to information about key wildlife resources managed by the SVNWR and compatible outdoor recreation opportunities (e.g., fishing, hiking, hunting, wildlife observation, photography).

General Project Activities and Implementation Timing

Project activities include implementation (construction, non-construction, and O&M) and monitoring.

The project would be completed in approximately 5 years. Construction of the amenities would occur after the parcel is acquired, beginning in Year 3. Post-construction monitoring would occur in Years 4-5.

Maintenance

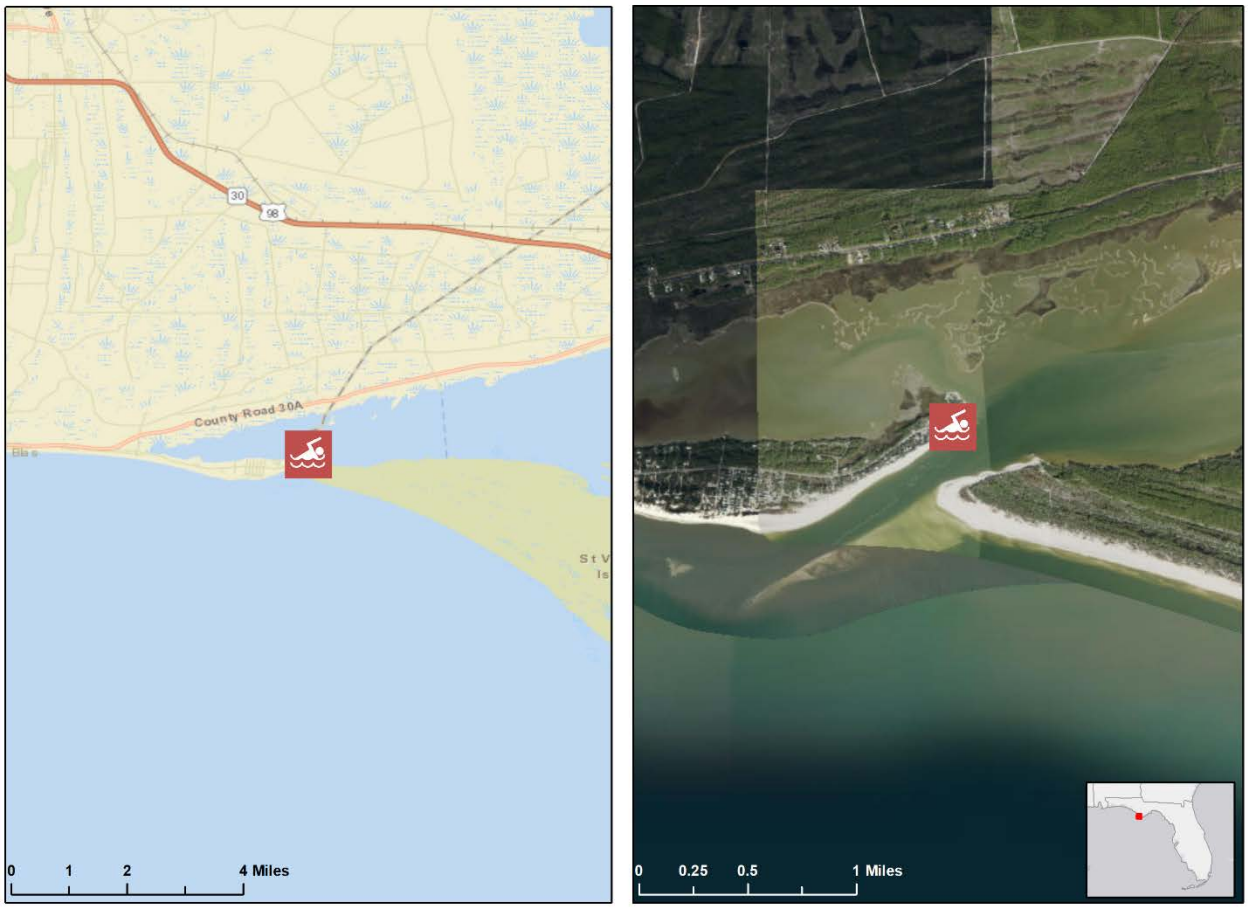
Short-term activities would include inspection and maintenance of amenities. Long-term maintenance on the existing boat ramp and ramp parking would be conducted by the County. SVNWR volunteers and staff would complete other maintenance on remaining amenities, specifically the kayak launch, boat dock/slip, and fishing areas. Friends of SVNWR would assist in maintenance and upkeep of the visitor contact station.

Project Monitoring

Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs
The estimated costs are $2,500,000 out of the Provide and Enhance Recreational Opportunities Restoration Type which includes costs for implementation, monitoring, oversight, and contingency. A portion of the acquisition costs, estimated to be $3,220,000, would be funded under the Habitat Projects on Federally Managed Lands Restoration Type described in Section 2.5.1. As such, the total project cost would be $5,720,000.

Figure 2-23 FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred): General Project Location



REC7, St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass

Restoration Approach

Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2)

Restoration Technique

N/A (see PDARP/PEIS Appendix 5.D.8.1)

Project Location

Indian Pass Campground, Gulf County (Figure 2-24)

Project Summary

This project would be implemented by the FWC and DOI FL TIG Trustees, in coordination with USFWS-SVNWR, Gulf County, and Friends of SVNWR. The goal of the project is to provide additional recreational improvements on the 10-15-acre parcel at Indian Pass that would be purchased under the proposed FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass project.

Specifically, the project would:

- **Remove the existing single-lane boat ramp**;
- **Construct a new double-lane boat ramp** west of the old boat ramp location. This would include creating a small lagoon, increasing vehicle/trailer unpaved parking from approximately 14 to 31 spaces, and adding monofilament fishing line recycling bins;
- **Construct a trail system, picnic areas, and an observation deck**.

Indian Pass and Indian Lagoon provide high-quality natural fish and wildlife habitat. The project would enhance public recreation in an area of the Panhandle being developed very quickly. Enhancement of these ecologically important lands would improve public recreational opportunities (e.g., walking trails, picnic areas, observation deck); access to surf and shoreline fishing for seatrout, redfish, and flounder; and improved access for paddlecraft and watercraft. Commercial crabbers, oystermen, and workers in the burgeoning aquaculture industry would benefit from enhanced boat ramp amenities. Construction of a double-lane boat ramp and additional parking in a developing area would provide anglers greater recreational access to offshore fishing opportunities for popular Gulf reef fish such as red snapper and grouper.

General Project Activities and Implementation Timing

Project activities include planning/design (E&D and permitting), implementation (construction), and monitoring. Management of the new boat ramp would be accomplished through a memorandum of understanding with Gulf County, who would continue to manage the boat ramp and the parking access.

The project would be completed in approximately 5 years. Planning/design of the boat ramp would occur in Years 1-2. Construction of the amenities would occur in Year 3. Post-construction monitoring would occur in Years 4-5.

Maintenance

Short-term activities would include inspection and maintenance of amenities. Long-term maintenance on the boat ramp and ramp parking would be conducted by the County. SVNWR volunteers and staff would complete other maintenance on remaining amenities, specifically the kayak launch, boat dock/slip, trail system, observation deck, picnic tables, and fishing areas. Friends of SVNWR would assist in maintenance and upkeep of the visitor contact station.

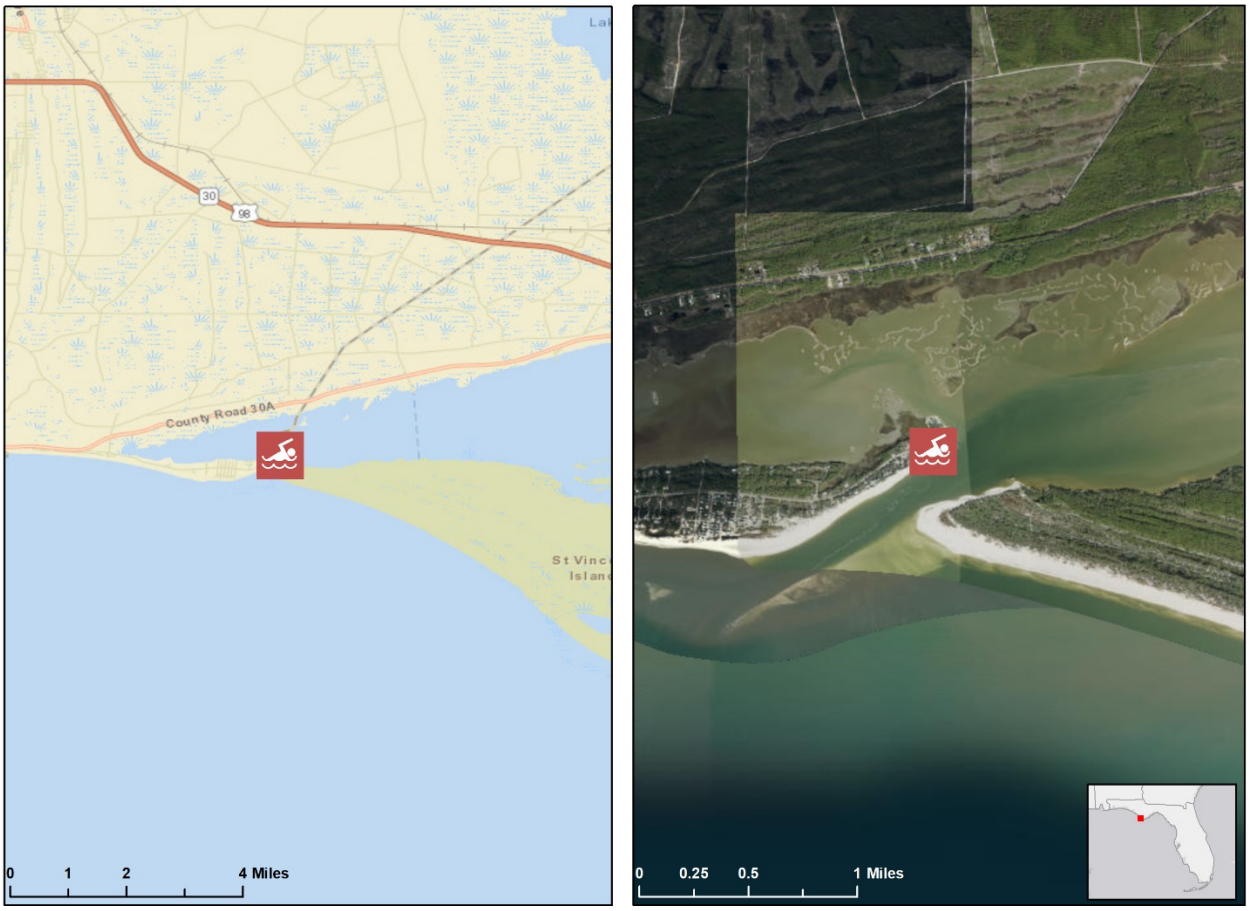
Project Monitoring

This project has not been identified as a preferred alternative by the FL TIG in this RP/EA, therefore, a project MAM plan has not been developed.

Costs

The total estimated costs are $3,218,988 which includes costs for planning, design, permitting, implementation, monitoring, oversight, and contingency.

Figure 2-24 **REC7, St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass: General Project Location**



REC8, Florida Artificial Reef Creation and Restoration – Phase 2 (preferred)

Restoration Approach

Enhance recreational experiences (PDARP/PEIS Section 5.5.14.2)

Restoration Technique

Place stone, concrete, or permissible materials to create artificial reef structures (PDARP/PEIS Appendix 5.D.8.2)

Project Location

Gulf of Mexico (federal and state waters) adjacent to Escambia, Santa Rosa, Okaloosa, Walton, Bay, Gulf, Franklin, and Wakulla Counties (Figure 2-25)

Project Summary

This project would be implemented by the FWC FL TIG Trustee in coordination with Escambia, Santa Rosa, Okaloosa, Walton, Bay, Gulf, Franklin, and Wakulla Counties and the City of Mexico Beach. Building upon the interagency partnerships developed during the DWH NRDA Florida Artificial Reef Creation and Restoration project (hereafter referred to as Phase 1), the project would implement Phase 2 of artificial reef development across Northwest Florida, creating new marine recreational fishing and diving opportunities for residents and visitors across the region.

Specifically, the project would:

- **Establish grant agreements** through partnerships with local coastal governments for project implementation (planning, selection, design, permitting, construction, and as-built documentation) off Escambia, Santa Rosa, Okaloosa, Walton, and Bay Counties. FWC would directly oversee activities in Gulf, Franklin, and Wakulla Counties;
- **Construct artificial reefs** with one or more of the following materials: 1) rock boulders, 2) prefabricated concrete, or 3) designed modules.

Representative target fish species enhanced by this project include amberjack, red snapper, vermilion snapper, triggerfish, kingfish, cobia, gag grouper, scamp grouper, and other reef fish and grouper/snapper species. Compared to Phase 1, this project provides a greater diversity of materials and locations to maximize recreational benefits across a broader geographic range and accommodate a greater variety of marine fish species to satisfy a wider spectrum of user groups.

The placement of artificial reefs would provide new recreational fishing opportunities and enhance fishing experiences for saltwater anglers and reduce fishing pressure at existing natural and artificial reef fishing destinations. By increasing the number of fishing sites, this project would help compensate for interim losses to recreational use of natural resources by the DWH oil spill.

General Project Activities and Implementation Timing

Project activities include planning/design (feasibility studies, E&D, and permitting), implementation (construction), and monitoring. FWC personnel would include a dedicated full-time FWC OPS Fisheries Biologist to provide oversight and contract management with support from the FWC Artificial Reef Program Administrator and two FWC Artificial Reef Program fisheries biologists.

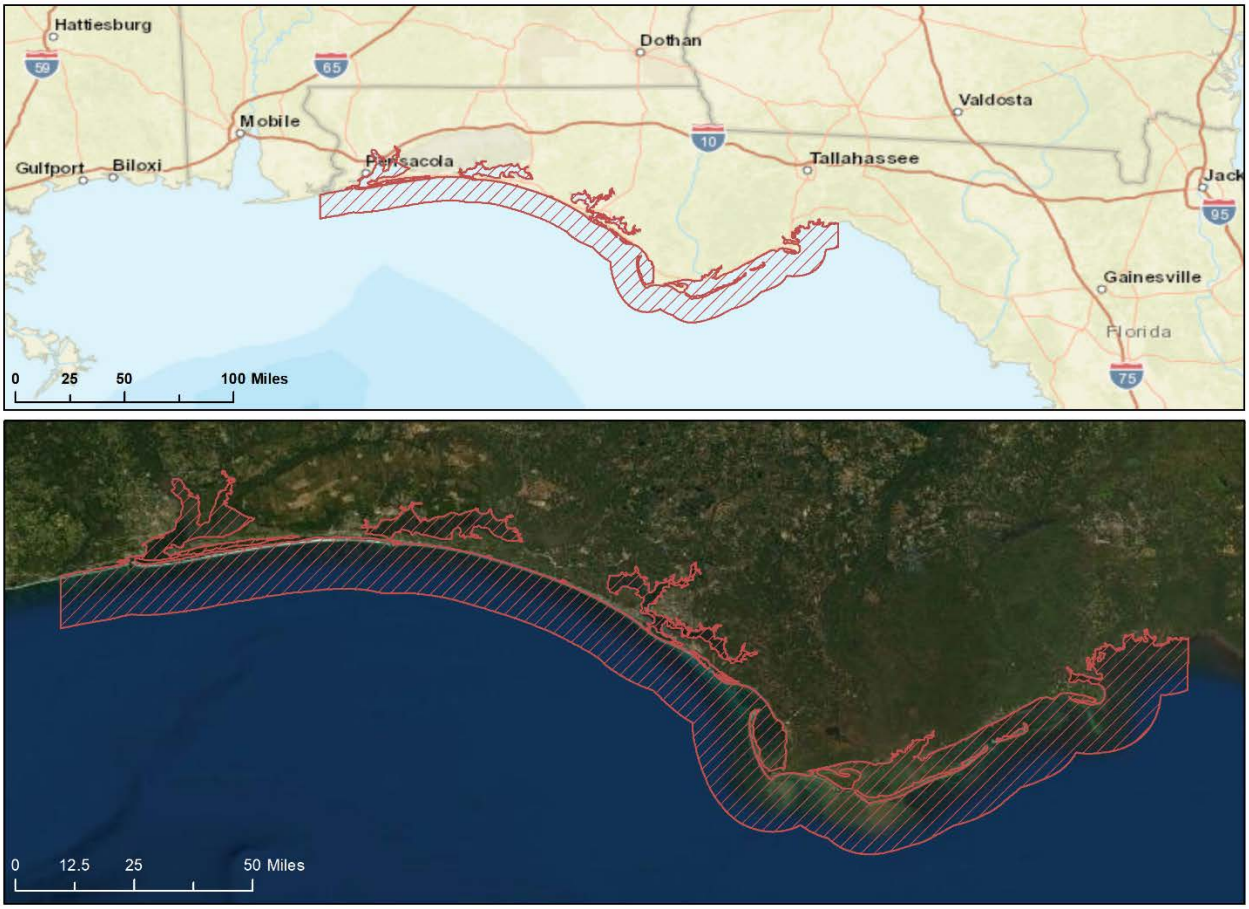
The project would be completed in approximately 5 years. Year 1 would include planning, selection, design, and permitting of sites that are not already permitted, and/or reauthorize permitted areas to be re-activated. Years 2-3 would include construction activities. Years 4-5 would include post-construction monitoring of the recreational use by FWC.

Maintenance

All artificial reef materials would be selected in compliance with permit conditions to ensure long-term durability and stability. As such, the selected artificial reef materials are expected to naturally colonize with attached organisms and reef associated fish, gaining complexity and species diversity over time. Therefore, short- and long-term maintenance activities are not anticipated.

Project Monitoring
Project monitoring details can be found in the project's MAM plan located in Appendix B.
Costs
The total estimated costs are $10,342,500 which includes costs for planning, design, permitting, implementation, monitoring, oversight, and indirect costs.

Figure 2-25 REC8, Florida Artificial Reef Creation and Restoration – Phase 2 (preferred): General Project Location



REC9, Apollo Beach Recreational Sportfish Hatchery Facility (preferred)

Restoration Approach

Enhance recreational experiences (PDARP/PEIS Section 5.5.14.2)

Restoration Technique

Enhance recreational fishing opportunities through aquaculture (PDARP/PEIS Appendix 5.D.8.2)

Project Location

Facility would be located in Apollo Beach. Hatchery releases would be in species-specific suitable habitats, such as Tampa Bay, Sarasota Bay, Charlotte Harbor, and their tributaries (Figure 2-26)

Project Summary

This project would be implemented by the FWC FL TIG Trustee. Florida has the nation's largest recreational fishing industry, contributing in excess of $10 billion annually to the state's economy and supporting one of the largest saltwater fishing-related tourism industries in the world (FWC 2020). The project goal is to enhance recreational fishing opportunities through aquaculture and release of marine sportfish, specifically red drum and spotted seatrout, into species-specific suitable habitats such as those found in parts of Tampa Bay, Sarasota Bay, and Charlotte Harbor and their tributaries.

Specifically, the project would:

- **Design and construct a 6,500-square foot fish production facility** to support production and release of up to one million juvenile red drum and spotted seatrout annually; and
- **Complete construction of an office building** (currently at 65%) to be used as an operations center for hatchery staff.

This project would be the second phase of development of the FWC marine fish stock enhancement facility at Apollo Beach. The goal of Phase 1 was to provide the broodstock capacity needed for a marine stock enhancement program in Florida. This included design and construction of a 10,000-square foot marine fish hatchery; design and partial construction of an office; and all necessary aquaculture equipment. Phase 1 was funded by state appropriations. Phase 2 would provide the necessary infrastructure to fully develop and improve techniques for fish production and reproduction techniques for stock enhancement and produce juvenile sportfish to further enhance recreational fishing opportunities and the natural fisheries populations.

The released sportfish would enhance and increase angling opportunities directly when they are caught and indirectly when survivors enter the adult spawning population. By increasing the number of sportfish available to be caught, this project would help compensate for interim losses to recreational use of natural resources by the DWH oil spill.

General Project Activities and Implementation Timing

Project activities include planning/design (E&D and permitting), implementation (construction), and monitoring. Professional design consultants would be responsible for building design, pre-construction permitting, bid-phase services, and construction oversight of the fish production facility and the office. A general contractor would be responsible for all construction-related permitting.

At no cost to this project, the FWC Public Access Services Office (PASO) with assistance from the FWC Stock Enhancement Research (SER) Group Administrator would coordinate project management including procurement of professional design consultants and the general contractor, oversight of the overall project schedule, pre-construction permitting and design schedules, and construction schedules. PASO would review and approve invoices and maintain the budget for the project. SER would provide oversight of the building design elements to fit the functions of the hatchery, coordinate utility service connections to the production hatchery, and lead the installations of the aquaculture equipment for the production hatchery.

During Phase 1, the Master Site Plan, which includes all drainage elevations, rainwater ponds, pervious and impervious surfaces, and future building locations, was permitted by Hillsborough County. The Southwest Florida Water Management District (SWFWMD) issued the Environmental Resources Permit to proceed with

development of the Master Site Plan. Site work was completed in Phase 1 and provides the footprint for construction of the fish production facility. Therefore, permits for this project should be streamlined.

Permitting for aquaculture effluent into an established and functioning human-made effluent pond and a human-made saltwater marsh follows the BMPs of the permitting institute, the Division of Aquaculture (State of Florida) and would support the entire site plan. The effluent pond serves as a fishing pond for thousands of Florida youth anglers each year who typically do not have angling experiences otherwise. This hatchery water effluent and fishing pond was planned by FWC to ensure compliance with the Division of Aquaculture BMPs for the entire Master Site Plan and has already been permitted for use by a not-for-profit conservation organization on the same property as the FWC hatchery. The source for seawater for the hatchery is an existing saltwater well permitted for use by the SWFWMD. Water capacity fees (permit) from Hillsborough County would be paid by FWC as part of this project. All pre-construction permitting is managed by the professional design consultants and those fees are built into their contract schedule of fees. All construction permit fees are managed by the general contractor and built into that schedule of fees.

The project would be completed in approximately 5 years. Procurement of professional services for building design, bid services, and construction monitoring would occur during the first 6-8 months (Year 1) of the project. The building design and bid-phase services would be completed early in Year 2. Procurement of a general contractor for building construction would occur in Year 2 followed by construction of the building and construction monitoring (Years 2-3). Following construction, FWC would use separate funding sources to install aquaculture production equipment (FWC-owned) within 12 months (Years 3-4). Within 18 months of completion of the facility (Year 4), FWC would produce and release hatchery fish into the wild. The number, size, and species of fish produced and released would be documented to their release location. These metrics would be included as a monitoring component for this project for 2 years after the production facility is fully operational (Years 4-5).

Maintenance

FWC would maintain the fish hatchery infrastructure and equipment using scheduled preventative maintenance plans which include both routine maintenance and monitoring checklists by FWC staff and annual inspections and services by professional trades. These maintenance routines are conducted at the completion of the construction and continue into the distant future to maximize lifespan of the building and equipment, maintain efficiency of equipment, and minimize total lifetime maintenance costs.

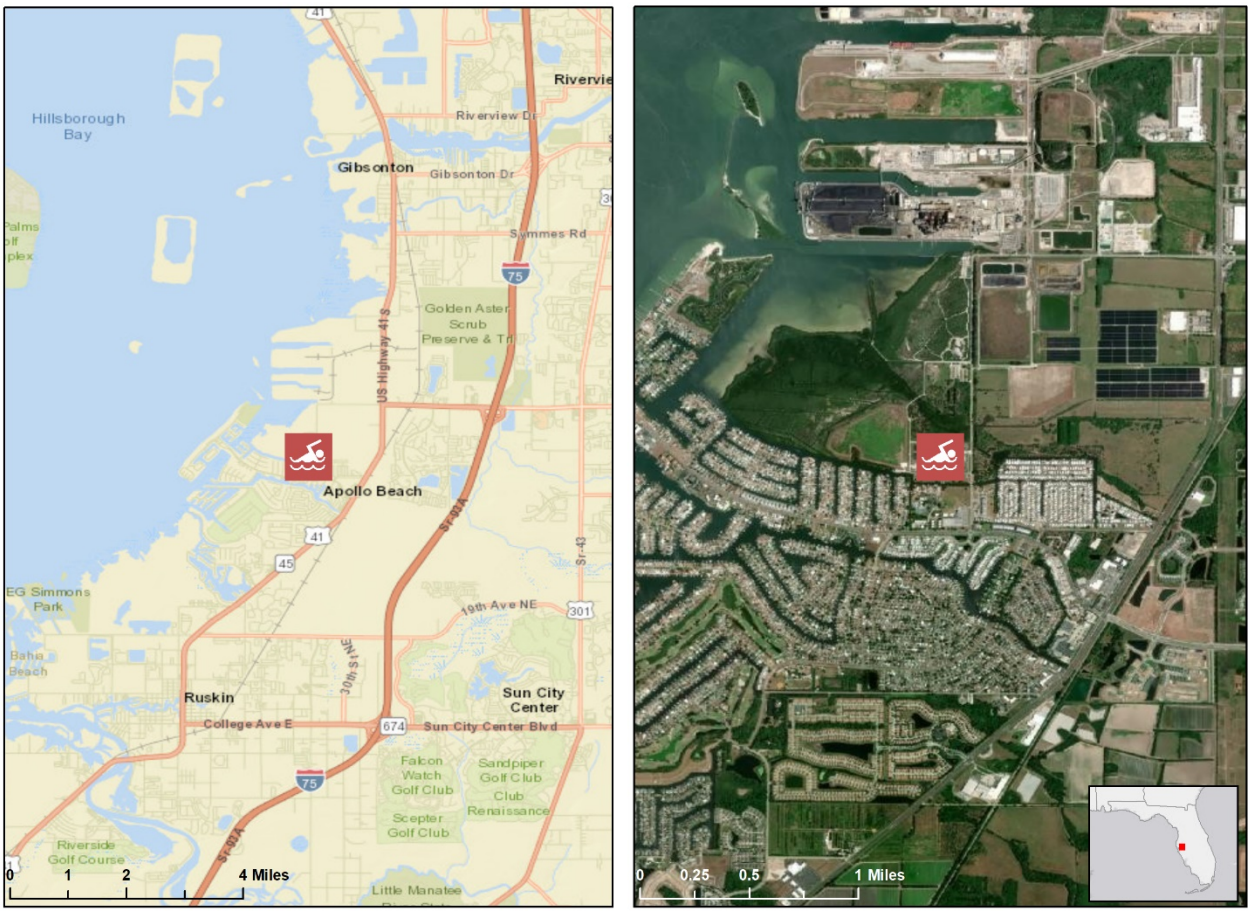
Project Monitoring

Project monitoring details can be found in the project's MAM plan located in Appendix B.

Costs

The total estimated costs are $4,620,000 which includes costs for planning, design, permitting, implementation, oversight, indirect costs, and contingency.

Figure 2-26 **REC9, Apollo Beach Recreational Sportfish Hatchery Facility (preferred): General Project Location**



CHAPTER 3 OPA EVALUATION OF REASONABLE RANGE OF ALTERNATIVES

The FL TIG developed a reasonable range of restoration alternatives for consideration and evaluation under OPA and NEPA in this RP/EA. The screening process to identify the reasonable range of alternatives and project descriptions are described in Chapter 2. The projects are listed in Table 2-2 and mapped in Figures 1-1 and 1-2.

This chapter provides an OPA analysis of each restoration project in this RP/EA including an evaluation of the project's consistency with OPA NRDA regulatory criteria. Sections 3.2-3.6 include the OPA evaluations for each project by Restoration Type, as follows:

- Habitat Projects on Federally Managed Lands: five alternatives[47] (Section 3.2);
- Sea Turtles: four alternatives (Section 3.3);
- Marine Mammals: two alternatives (Section 3.4);
- Birds: five alternatives (Section 3.5); and
- Provide and Enhance Recreational Opportunities: nine alternatives[47] (Section 3.6).

3.1 Overview of OPA Evaluation of Restoration Alternatives

Consistent with the OPA NRDA regulations, the Trustees identified a reasonable range of alternatives (15 CFR § 990.53(a)(2)) to be evaluated according to OPA NRDA regulatory evaluation criteria (15 CFR § 990.54). Chapter 2 describes the screening process the FL TIG conducted to develop the reasonable range of alternatives. The Trustees used the criteria provided in the OPA NRDA regulations (15 CFR § 990.54(a)) to evaluate the reasonable range of alternatives and identify preferred restoration alternatives. This chapter includes the FL TIG's evaluation of the alternatives in accordance with the OPA NRDA regulations, which include:

- **The cost to carry out the alternative** (Cost-effectiveness). This criterion considers whether the cost to carry out the alternative is reasonable, appropriate, and comparable to other similar restoration alternatives. The FL TIG considered the estimated cost of the alternative, including, if appropriate, the costs for design, planning, permitting, construction, oversight and management, and monitoring and maintenance.
- **Trustee goals and objectives** (Goals and objectives). This criterion considers the extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the DWH-injured natural resources and services to baseline and/or compensating for interim losses (the

[47] One alternative (FM5/REC7, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass) is proposed and counted under two Restoration Types: Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities.

ability of the project to provide comparable resources and services; that is, the nexus between the project and the injury). This encompasses the PDARP/PEIS programmatic Restoration Goals and Types (Section 5.3.1 of the PDARP/PEIS). For example, for the Provide and Enhance Recreational Opportunities Restoration Type alternatives, the FL TIG evaluated the nature, magnitude, and distribution of recreational use benefits, specifically providing and/or enhancing recreational fishing opportunities, expected to be provided to the public.

- **Likelihood of success**. This criterion includes consideration of each project's likelihood of success such as whether the alternative proposes approaches or techniques that have been executed successfully in the past; whether the approach or technique is routinely employed; and whether there are significant impediments to successful implementation and/or realization of the project benefits (e.g., local support for a project, potential regulatory compliance issues).
- **Prevents future injury and avoids collateral injury** (Avoid collateral injury). This criterion evaluates the extent to which an 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 RP/EA prevent future injuries from the incident. Instead, for this OPA evaluation, the FL TIG focused on whether the restoration alternative had the potential to cause direct or indirect collateral environmental injuries. For projects proposing more than E&D activities (i.e., implementation), these considerations are covered in more detail in the environmental consequences sections of Chapter 4.
- **Benefits multiple natural resources/services** (Benefits). This criterion evaluates the extent to which an alternative would provide benefits to more than one natural resource and/or service. This includes whether the project benefits would make the alternative more valuable to the public (e.g., by providing both recreational and ecological benefits).
- **Effects on public health and safety** (Health and safety). This criterion evaluates whether any aspect of the alternative could affect public health and/or safety. This evaluation includes consideration of both positive and negative impacts that cannot be mitigated.

Based on the evaluation of the factors listed above, the Trustees select preferred restoration alternative(s). If two or more alternatives are equally preferable based on these factors, the Trustees select the most cost-effective alternative (15 CFR § 990.54(b)).

3.2 OPA Evaluation: Habitat Projects on Federally Managed Lands Alternatives

Table 3-1 provides an evaluation of the consistency with OPA criteria for each of the projects in the reasonable range of alternatives consistent with the Restore and Conserve Habitat Restoration Goal and underlying Habitat Projects on Federally Managed Lands Restoration Type. Additional information on Habitat Projects on Federally Managed Lands alternatives is provided in Section 2.5.1.

Table 3-1 Evaluation of OPA criteria for the Habitat Projects on Federally Managed Lands alternatives

Alternatives	OPA Evaluation
FM1, Johnson Beach Access Management and Habitat Protection (preferred)	*Cost-effectiveness*: The total estimated cost of $3,200,000 includes project planning and design, permitting, implementation, monitoring, oversight and management, and contingency funds. This project leverages GUIS NPS base funds to provide a full-time law enforcement ranger to enforce parking and speed rules on the Perdido Key Unit of GUIS. The costs to carry out this alternative are based on similar projects to restore and protect beach and dune habitat and DOI's experience, and, in the judgment of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Restore and Conserve Habitat Restoration Goal and underlying Habitat Projects on Federally Managed Lands Restoration Type. This project would protect beach and dune habitat at GUIS by providing dune crossovers, post-and-rope fencing, and other foot/vehicular traffic control measures as well as human and predator disturbance-deterrent measures. This project has a clear nexus to DWH oil spill injuries as it would restore GUIS habitats and benefit species that were directly injured by oiling and/or response activities associated with the spill. *Likelihood of success*: This project utilizes standard approaches to protect beach and dune habitat such as dune crossovers, strategic placement of parking lots, and foot-traffic-control measures (e.g., symbolic fencing habitat closures) to protect sensitive habitats and resources. DOI has a long history of successfully managing visitor impacts on sensitive habitats and living resources at GUIS and other federally managed lands, including the DWH NRDA Beach and Dune Habitat Protection at Gulf Islands National Seashore project. As such, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on mitigating the negative impacts of human disturbance on sensitive beach and dune habitat and resources. Wildlife surveys would be conducted by GUIS staff during and post-construction to mitigate any minor impacts that may occur to protected resources during construction and post-construction while visitors use the new parking lots and dune crossovers. Established protocols and methods for temporary fencing and trash management would be used to avoid incidental mortality. Finally, an EA was previously conducted for this project in 2016 (NPS 2016b) where a finding of no significant impact was issued. The USFWS also determined that the project would not jeopardize the Perdido Key beach mouse or adversely affect its habitat and was not likely to adversely affect other federally listed species. *Benefits*: The primary benefit of this project is to protect and restore dunes and beaches that provide important coastal habitat for beach-nesting birds, beach mice, and sea turtles, allowing the habitat to recover its natural vegetation and processes with as little human disturbance as possible. This project would also serve to enhance popular recreational areas for local visitors and tourists by

Alternatives	OPA Evaluation
	managing access away from roadside parking through the addition of designated parking lots, adding and replacing dune crossovers, and creating a bicycle-pedestrian-only path. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety. This project would provide a greater margin of safety for potential public health effects by creating designated parking areas which would allow emergency vehicles to drive down the road, building ADA-compliant dune crossovers, and creating a dedicated bicycle-pedestrian-only path that would reduce pedestrian interactions with vehicles. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred alternative in this RP/EA.

Alternatives	OPA Evaluation
FM2, Perdido Key Sediment Placement (preferred)	*Cost-effectiveness*: The total estimated cost of $6,773,000 includes engineering, design, permitting, sand placement, monitoring, oversight, and contingency funds. The costs to carry out this alternative are found to be reasonable, appropriate, and comparable to similar projects. DOI, as the Implementing Trustee, would look for opportunities to coordinate with USACE's O&M dredging cycle at Pensacola Pass to reduce implementation costs. *Goals and objectives*: This project is consistent with the Restore and Conserve Habitat Restoration Goal and underlying Habitat Projects on Federally Managed Lands Restoration Type. This project would improve and increase beach habitat on the Gulf side of Perdido Key at GUIS by supplementing the sand-starved sediment budget. This project has a clear nexus to DWH oil spill injuries as GUIS habitat that was directly injured by oiling and/or response activities associated with the spill. *Likelihood of success*: Sand placement is a routine technique used to partially restore the natural sediment budget on coastlines. A similar successful project, utilizing the same sand placement methods, was completed at Perdido Key between 2011 and 2012, therefore, this project is likely to be successful. *Avoid collateral injury*: This project would not likely cause collateral injury to natural resources. During implementation, activities would be conducted according to conditions outlined in the project's existing BO (such as placing sediment outside of beach-nesting bird and sea turtle nesting season) to avoid or minimize impacts to sea turtles, birds, and marine mammals. *Benefits*: The primary benefit of this project would be improvement of beach habitat. This project would address the unnaturally eroding beach by re-introducing sand into the barrier island system along the southeast shore of Perdido Key. With episodic overwash events, the FL TIG anticipates it would increase sandy habitat elsewhere on Perdido Key, north of the primary dune line. This project would provide benefits to a range of wildlife species that utilize the habitat, including birds and sea turtles. A secondary benefit would be additional public access to recreational areas for local visitors and tourists. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety. USACE requires that contractors develop a safety plan for all project activities. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
FM3, Old Fort Pickens Road Utility Line Relocation	*Cost-effectiveness*: The total estimated cost of $1,249,930 includes planning, design, permitting, construction, monitoring, project oversight, and contingency funds. The costs to carry out this alternative are based on similar projects and are found to be reasonable and appropriate. *Goals and objectives*: This project is consistent with the Restore and Conserve Habitat Restoration Goal and underlying Habitat Projects on Federally Managed Lands Restoration Type. This project would protect beach habitat and allow for natural dune recovery at GUIS by moving utility lines that are at risk of damage from erosion. This project has a nexus to DWH oil spill injuries as the GUIS habitat was directly injured by oiling and/or response activities associated with the spill. *Likelihood of success*: This project would move buried utility lines north along a stretch of Fort Pickens Road at GUIS. The NPS successfully moved Fort Pickens Road to the north in 2017 to reduce risk of flooding and erosion at the old road site. Based on the success of the road re-alignment, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on the removal of buried utility lines that would eliminate a potential safety hazard and ensure the habitat is not disrupted in the future if the utility lines are exposed to storm surge. Once the lines are reburied along the new road site, the beach and dune habitats at the original site would be able to recover without future threat of disturbance from utility maintenance. Delaying the utility line relocation may result in more severe impacts to future beach and dune habitats as these habitats become more established and vegetation returns to the old roadbed. Finally, the project is not expected to cause collateral injury to natural resources. *Benefits*: The primary benefit of this project is to reduce disturbance to beach and dune habitat that would occur with maintaining or re-aligning the active utility lines at a future date. This project would also reduce the risk of further harming natural resources through utility line damage by moving vulnerable utility lines away from erosion and storm surge. While the current utility line location poses a risk to beach and dune resources, this project has minimal direct benefit to resources injured by the DWH oil spill. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety as the construction portion of this project would be implemented by licensed and trained utility providers. *Summary*: Based on the OPA evaluation, specifically for project benefits (to injured resources) when compared with the other alternatives, this project was not identified as a preferred restoration alternative by the FL TIG in this RP/EA.

Alternatives	OPA Evaluation
FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits (preferred)	*Cost-effectiveness*: The total estimated cost of $540,000 includes implementation of the lighting retrofits, O&M, monitoring, project oversight, and contingency funds. The costs to carry out this alternative are based on similar projects and DOI's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Restore and Conserve Habitat Restoration Goal and underlying Habitat Projects on Federally Managed Lands Restoration Type. This project would enhance Florida's federally-managed coastal habitats and reduce negative impacts of lighting on habitat that supports wildlife, including sea turtles and birds, by converting existing low-pressure sodium lamps into wildlife-friendly lighting fixtures, reducing disorientation effects on turtle hatchlings and other species from the existing lamps. This project has a clear nexus to injuries as it would improve GUIS habitats that also support species that were directly injured by oiling and/or response activities associated with the DWH oil spill. *Likelihood of success*: This project utilizes established and reliable methods to reduce artificial lighting by upgrading existing lighting infrastructure to wildlife-friendly lighting. Similar efforts have been successfully completed on Pensacola Beach as part of two previous DWH-funded projects, the NRDA Improving Habitat Injured by Spill Response: Restoring the Night Sky project and the NFWF-GEBF Eliminating Light Pollution at Sea Turtle Nesting Beaches (Phase II) project. Therefore, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on mitigating the negative impacts of lighting on wildlife habitat and is not expected to cause collateral injury to natural resources. Retrofit implementation would use existing lighting poles, so no ground-disturbing activities would occur. *Benefits*: The primary benefit of this project is to reduce the negative impacts of lighting and sky glow on beach and dune areas in and near GUIS that can disorient or otherwise negatively impact wildlife. This project would focus on eliminating damaging sources of light pollution and using alternative light fixtures to reduce negative impacts on wildlife including sea turtles and birds. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety. The project would provide a greater margin of safety by improving public night vision. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred)[48]	*Cost-effectiveness*: The total estimated cost of $5,720,000 includes land acquisition, implementation of minor recreational improvements, monitoring, project oversight, and contingency funds. The land acquisition portion of the project is proposed for partial funding ($3,220,000) under the Habitat Projects on Federally Managed Lands Restoration Type. SVNWR currently leases a boat slip on the parcel for $14,400 per year. Acquiring the boat slip and parcel would increase cost-efficiency by eliminating the need for the annual lease fee in perpetuity. Additionally, preventing habitat loss is generally more cost-effective than restoration. The parcel purchased would be protected from further development, preventing additional loss of habitat. The costs to carry out this alternative are based on best available estimates of market value. Appraisals would be performed to establish a fair market value. The costs are based on similar projects acquiring land for public use that have been successfully implemented, including the DWH NRDA Florida Coastal Access Project, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Restore and Conserve Habitat Restoration Goal and underlying Habitat Projects on Federally Managed Lands Restoration Type. This project would secure access to SVNWR in perpetuity. This project has a clear nexus to DWH oil spill injuries as SVNWR habitat was directly injured by oiling and/or response activities associated with the spill. This project secures easy access to SVNWR for staff to conduct necessary research and management of the resources on the island including beach-nesting birds, songbirds, wading birds, sea birds, and sea turtles. *Likelihood of success*: This portion of the project would include purchase and transfer of a privately-owned coastal parcel to public management for use in perpetuity. Similar projects acquiring land for public use have been successfully implemented, including the DWH NRDA Florida Coastal Access Project. As such, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project would not likely cause collateral injury to natural resources. The project aims to mitigate impacts that may occur to coastal resources if the parcel were to sell to a developer, which would result in SVNWR needing to dredge Class II shellfish waters to gain new access to SVNWR. *Benefits*: The primary benefit of this portion of the project would be providing access to federally managed lands in perpetuity. SVNWR is only accessible by boat, so adding this property with a boat slip secures access and provides yearly cost savings. Reduced SVNWR access due to the loss of the slip would adversely impact the ability for staff to conduct land management activities at SVNWR, which would degrade habitat on the island. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety. Because the parcel is one of few remaining green spaces on the Indian Pass peninsula, protecting this site would have public health benefits by providing a publicly available recreation area. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

[48] This project is also analyzed under the Provide and Enhance Recreational Opportunities Restoration Type.

3.3 OPA Evaluation: Sea Turtles Alternatives

Table 3-2 provides an evaluation of the consistency with OPA criteria for each of the projects in the reasonable range of alternatives consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and the underlying Sea Turtles Restoration Type. Additional information on the Sea Turtles alternatives is provided in Section 2.5.2.

Table 3-2 Evaluation of OPA criteria for the Sea Turtles alternatives

Alternatives	OPA Evaluation
ST1, Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast (preferred)	*Cost-effectiveness*: The total estimated cost of $1,394,808 includes implementation (e.g., establishing pier observers), Trustee oversight, indirect costs, and contingency funds. Where possible, the FL TIG would coordinate implementation of this project with the RW TIG, which is currently planning restoration for sea turtles, to improve cost-effectiveness. Based on the costs of similar social science and educational activities and FWC's experience, the FL TIG considers the costs to carry out this alternative reasonable and appropriate. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Sea Turtles Restoration Type. The project has a clear nexus to DWH oil spill injuries as it would help compensate for losses to sea turtle species resulting from the spill by developing and implementing activities which would directly reduce mortality and injury to sea turtles from negative interactions with hook-and-line fishing gear. More specifically, the conservation activities developed as part of this project align with restoration techniques identified in the DWH Strategic Framework for Sea Turtle Restoration Activities. *Likelihood of success*: This project focuses on analyzing existing data, collecting additional observational information at fishing piers where incidental hooking occurs, and convening experts to develop an incidental hooking plan to be voluntarily implemented by piers. Any conservation measures or recommendations identified through this project would be informed by science, as well as the knowledge of FWC staff and stranding and pier managers. The FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: As primarily a data collection effort, this project is not expected to cause collateral injury to natural resources. This project focuses on reducing sea turtle injury and mortality in recreational fisheries through data evaluation, observational data collection, and development and implementation of conservation measures. Project activities may also include responding to hooked sea turtles, in which case the responding individual would obtain and comply with a FWC marine turtle permit. *Benefits*: Reports of incidental hooking are increasing across the state. This project would provide the information needed to fully inform appropriate response actions to maximize turtle survival after a hooking event and implement preventative measures to reduce hooking rates. Reducing hooking incidences and improving response outcomes should reduce overall sea turtle injury and mortality at fishing piers. This project could also result in indirect benefits to other species, including marine mammals, through overall outreach and education for anglers. *Health and safety*: This project includes data collection activities that do not involve risks to health and safety. As such the FL TIG does not anticipate any negative impacts to public health and safety. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
ST2, Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast (preferred)	*Cost-effectiveness*: The total estimated cost of $3,667,400 includes project implementation (e.g., in-water debris removal activities), monitoring, oversight, indirect costs, and contingency funds. Where possible, the FL TIG would coordinate implementation of this project with the RW TIG, which is currently planning restoration for sea turtles, to improve cost-effectiveness. The costs to carry out this alternative are based on similar projects and FWC's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Sea Turtles Restoration Type. More specifically, marine debris removal and prevention activities that would be implemented as part of this project align with restoration techniques identified in the DWH Strategic Framework for Sea Turtle Restoration Activities. This project has a clear nexus to spill injuries; reducing marine debris directly benefits sea turtle species that were injured as a result of the DWH oil spill. *Likelihood of success*: This project includes marine debris removal and prevention (e.g., education and fishing gear collection) efforts. FWC and partners have other successful marine debris prevention and removal programs. FWC would first identify marine debris hotspots by evaluating existing data. Targeting these hotspots through a phased approach would improve successful identification and removal and/or prevention of additional marine debris. The FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on reducing sea turtle mortality from entanglement with marine debris through removal and prevention activities. Activities would employ appropriate measures to avoid collateral injury; as such, the FL TIG does not anticipate any collateral injury to other natural resources. *Benefits*: The primary benefit of this project is to reduce injury and/or mortality of sea turtles from ingestion of, entanglement in, and entrapment in marine debris through prevention and removal activities. This project is anticipated to reduce the amount of derelict fishing gear in hotspot areas where it poses a hazard to sea turtle species. Reducing marine debris is also expected to result in ancillary benefits to other species, including birds and marine mammals, through the overall improvement of habitats such as reefs, seagrass beds, and marshes. *Health and safety*: Marine debris removal activities have the potential to overlap with recreational use of marine habitats. Removal activities would employ appropriate measures to avoid negative impacts to human health and safety. Additionally, removing marine debris could mitigate human safety risks that arise when recreating in the marine environment. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred alternative in this RP/EA.

Alternatives	OPA Evaluation
ST3, Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast (preferred)	*Cost-effectiveness*: The total estimated cost of $1,155,000 includes project implementation (e.g., vessel-based data collection), indirect costs, and contingency funds. The costs to carry out this alternative are based on similar projects and FWC's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Sea Turtles Restoration Type. The project has a clear nexus to DWH oil spill injuries as it would help compensate for losses to sea turtle species resulting from the spill. More specifically, the vessel strike characterization and educational activities align with restoration techniques identified in the DWH Strategic Framework for Sea Turtle Restoration Activities. *Likelihood of success*: This project includes characterization of vessel strike events in Florida waters and creation of a public awareness campaign to reduce vessel strikes and encourage responsible boating practices. This project would build on work completed through grants from NFWF's Sea Turtles Program such as Mitigating the Exposure of Sea Turtles to Vessel Strikes in Florida project and from the Florida Sea Turtle License Plate program's Understanding the Exposure of Sea Turtles to Vessels: Determining the Potential Impacts of Vessel Strikes in South Florida project. The FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: As primarily a data collection and educational effort, this project is not expected to cause collateral injury to natural resources. This project focuses on reducing sea turtle mortality from vessel strikes through data evaluation, observational data collection, and development and implementation of an educational campaign. Project activities include vessel-based observation and data collection, and vessel-based activities would comply with all FWC marine turtle permit and NMFS permit requirements. *Benefits*: The primary benefit of this project is to reduce injury and/or mortality of sea turtles from motorized watercraft by utilizing compiled data to conduct a public awareness campaign. The campaign would educate the public about sea turtles and the threat of vessel strikes to promote responsible boating practices. Ancillary benefits to other species that experience vessel strikes, including marine mammals, could occur. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety as the project includes primarily data analysis and public outreach and education. Further, this project may benefit human health and safety by reducing the risk of boating accidents that result from direct or near-collisions with sea turtles. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
ST4, Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast	*Cost-effectiveness*: The total estimated cost of $1,492,700 includes planning and design, feasibility studies, implementation of barrier removals and educational materials, monitoring, oversight, and contingency funds. Where possible, the FL TIG would coordinate implementation of this project with the RW TIG, which is currently planning restoration for sea turtles, to improve cost-effectiveness. The costs to carry out this alternative are based on similar projects and FWC's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Sea Turtles Restoration Type. This project has a clear nexus to DWH oil spill injuries as it would help compensate for losses to sea turtle species resulting from the spill. More specifically, the shoreline barrier reduction and educational activities align with restoration techniques identified in the DWH Strategic Framework for Sea Turtle Restoration Activities. *Likelihood of success*: This project includes characterization of shoreline barriers to nesting sea turtles in Florida and creation of site-specific restoration plans to improve nesting habitat. Activities would be implemented in phases to first identify barriers and specific beach targets, then create and implement the plans, increasing the likelihood of success. The FL TIG may have opportunities to coordinate project planning and implementation with the RW TIG. To increase the likelihood of success of this project, and ensure this project builds on any work previously completed or in progress, the FL TIG believes this project would be best implemented after there is further coordination with the RW TIG and/or other sea turtle restoration planning efforts. *Avoid collateral injury*: This project focuses on increasing sea turtle reproductive success through targeted removal of physical barriers from nesting beaches. Project activities may include large barrier removals that require heavy machinery, in which case FWC and DOI as the Implementing Trustees would follow BMPs to reduce collateral injury to resources. *Benefits*: The primary benefit of this project is to remove nesting beach barriers through site-specific restoration and educational campaigns. Ancillary benefits to other species such as beach-nesting birds as well as benefits to beach and dune habitats are expected. Benefits would likely be greater if project planning and implementation were coordinated with other sea turtle restoration efforts. *Health and safety*: Nesting beach barrier removal activities have the potential to overlap with recreational use of beach and dune habitats. Additionally, the project may involve the public in removal activities, which could pose a risk to health and safety. Removal activities and public outreach events would employ appropriate measures to avoid impacts to human health and safety; as such, the FL TIG does not anticipate any negative impacts to health and safety. *Summary*: Based on the OPA evaluation, specifically for likelihood of success, this project was not identified as a preferred alternative by the FL TIG in this RP/EA.

3.4 OPA Evaluation: Marine Mammals Alternatives

Table 3-3 provides an evaluation of the consistency with OPA criteria for each of the projects in the reasonable range of alternatives consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and the underlying Marine Mammals Restoration Type. Additional information on the Marine Mammals alternatives is provided in Section 2.5.3.

Table 3-3 Evaluation of OPA criteria for the Marine Mammals alternatives

Alternatives	OPA Evaluation
MM1, Florida Gulf Coast Marine Mammal Stranding Network (preferred)	*Cost-effectiveness*: The total estimated cost of $5,000,000 includes implementation of MMSN activities, oversight, and indirect costs. The costs to carry out this alternative are based on similar projects and FWC's and NOAA's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Marine Mammals Restoration Type. This project has a clear nexus to DWH oil spill injuries as it would help compensate for losses to marine mammals from the spill. More specifically, the stranding response and data collection activities align with restoration techniques identified in the DWH Strategic Framework for Marine Mammal Restoration Activities. *Likelihood of success*: The project would rely on best available science, proven techniques, and established methods of the successful nationwide MMSN program. This project would build on the success of NFWF-GEBF's Increased Capacity for Marine Mammal Response and Analysis project in Florida, and is similar to DWH NRDA projects implemented by the Louisiana TIG (LA TIG) and AL TIG.[49] As such, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: Proposed stranding response and data collection activities would be conducted under well-established MMSN protocols which are subject to regulatory requirements, permits, and vetted BMPs. Should any potential collateral effects be identified, FWC and NOAA as Implementing Trustees would follow BMPs to minimize these effects. *Benefits*: This project provides support to the existing MMSN program to maintain response to stranded marine mammals, data collection, and necropsy efforts to improve early detection and mitigation of threats to marine mammals and improve understanding of causes of morbidity and mortality. Reduced response time and improved understanding are expected to directly increase marine mammal survival, benefitting multiple species of marine mammals injured by the DWH oil spill. *Health and safety*: The FL TIG does not anticipate any adverse impacts on public health and safety. Relevant safety measures and practices for handling and responding to marine mammal incidents would be followed. Further, data collection and analysis activities that include field monitoring would be conducted by trained scientists with no involvement from the public. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

[49] The LA TIG RP5/EA project "Increasing Capacity and Expanding Partnerships along the Louisiana Coastline for Marine Mammal Stranding Response" can be found at www.gulfspillrestoration.noaa.gov/sites/default/files/2020-08%20LA%20Louisiana%20Trustee%20Implementation%20Group%20Final%20RP.EA5_.pdf
The AL TIG RP2/EA project "Enhancing Capacity for the Alabama Marine Mammal Stranding Network" can be found at www.gulfspillrestoration.noaa.gov/project?id=144.

Alternatives	OPA Evaluation
MM2, Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities	*Cost-effectiveness*: The total estimated cost to carry out this alternative of $2,399,300 includes planning and design, implementation of social science studies and educational activities, monitoring, oversight, and contingency funds. The costs to carry out this alternative are based on similar projects and NOAA's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Marine Mammals Restoration Type. The project goal is to reduce lethal impacts to dolphins from illegal feeding activities by effectively changing human behavior through a targeted outreach and education strategy. As such, this project has a clear nexus to DWH oil spill injuries as it would help compensate for losses to marine mammals from the spill. More specifically, the social science studies and identification of conservation measures align with restoration techniques identified in the DWH Strategic Framework for Marine Mammal Restoration Activities. *Likelihood of success*: The project would be implemented in a phased approach to first characterize illegal feeding occurrences and identify motivations and receptiveness to different outreach approaches. The information would then be used to develop a targeted outreach plan and associated tools and collaboratively implement measures to reduce bottlenose dolphin injury and mortality from these feeding events. Although the FL TIG has not conducted these activities previously, based on experience with similar activities, the FL TIG anticipates the project would be implemented successfully. *Avoid collateral injury*: The FL TIG does not anticipate this project would have any collateral injuries to natural resources as all project activities are social science or educational in nature. *Benefits*: The primary benefit of this project would be the creation of a targeted outreach plan and educational materials to change human behavior associated with illegal feeding activities. Illegal feeding is well-documented along the Florida Gulf Coast and can increase bottlenose dolphins' risk of boat-strike or gear entanglement, increase risk for retaliation by anglers, and become an increased problem over time through social learning. This project would fill information gaps about the nature and extent of these interactions, the publics' motivations/perceptions/attitudes, and receptiveness to different messages and tools. While this project would attempt to change human behavior through outreach and education, it may not result in direct benefits to bottlenose dolphins through a reduction in the occurrence of illegal feeding activities. *Health and safety*: The FL TIG does not anticipate any adverse impacts on public health and safety as this is primarily a data analysis and educational project. *Summary*: Based on the OPA evaluation, specifically the benefits to bottlenose dolphins, this project was not identified as a preferred restoration alternative by the FL TIG in this RP/EA.

3.5 OPA Evaluation: Birds Alternatives

Table 3-4 provides an evaluation of the consistency with OPA criteria for each of the projects in the reasonable range of alternatives consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and the underlying Birds Restoration Type. Additional information on the Birds alternatives is provided in Section 2.5.4.

Table 3-4 Evaluation of OPA criteria for the Birds alternatives

Alternatives	OPA Evaluation
B1, Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers (preferred)	*Cost-effectiveness*: The total estimated cost of $1,748,639 includes planning and design, permitting, construction, monitoring, indirect costs, and contingency funds. The costs to carry out this alternative are based on similar projects and FWC's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Birds Restoration Type. The project has a clear nexus to spill injuries as it would help compensate for losses to birds from the DWH oil spill, specifically American oystercatchers. More specifically, the oyster reef expansion activities align with restoration techniques identified in the DWH Strategic Framework for Bird Restoration Activities. *Likelihood of success*: This project utilizes reliable methods to enhance oyster reefs and install breakwaters to provide bird nesting and foraging habitat. Based on similar successful efforts, such as the NFWF-GEBF Recovery and Resilience of Oyster Reefs in the Big Bend of Florida project, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on the restoration of oyster reef habitat for birds. All construction and installation activities would be restricted to the non-breeding season for birds, and FWC, as the Implementing Trustee, would use established protocols and methods to minimize collateral injury of protected resources and critical habitats. *Benefits*: The primary benefit of this project is to increase nesting and foraging habitat for American oystercatchers through oyster reef enhancements. The area around Cedar Key has many important nesting sites that are increasingly threatened by overwash and erosion. Installing oyster shell rakes and a breakwater along Gomez Key would help enhance resiliency of the island and reduce the risk of losing a critical American oystercatcher breeding colony. Ancillary benefits to other bird species and oyster reef habitat are expected. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety as this project would occur on a small offshore island. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
B2, Egmont Key Vegetation Management and Dune Retention (preferred)	*Cost-effectiveness*: The total estimated cost of $466,143 includes planning and design, permitting, implementation of chemical treatments and installation of native plants and sand fencing, monitoring, oversight, and contingency funds. Initial investments in the implementation of Phase I of this project provided valuable information on the number of invasive species treatments likely to be needed, applicable costs, and the effectiveness of various methods. The FL TIG used this information in developing the cost estimate. As such, the costs to carry out this alternative are based on similar projects and DOI's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Birds Restoration Type. The project has a clear nexus to DWH oil spill injuries, as it would help compensate for losses to birds from the spill, specifically beach-nesting birds and wading birds. More specifically, vegetation management methods align with restoration techniques identified in the DWH Strategic Framework for Bird Restoration Activities. *Likelihood of success*: This project utilizes reliable vegetation management methods to restore beach and dune habitat for birds. EKNWR implemented Phase 1 of the project during 2019 and 2020, successfully removing 13 acres of coin vine and replanting native plants. Based on Phase 1 success, the FL TIG anticipates this project would have a high likelihood of success for treating the remaining coin vine. *Avoid collateral injury*: All treatment activities would occur outside of bird and sea turtle nesting seasons to minimize collateral injury. Additionally, all chemical treatment activities, native plantings, and sand fence installation would be conducted by trained personnel in accordance with required permits. *Benefits*: The primary benefit of this project is the enhancement of nesting and foraging habitat for a variety of shorebirds, sea birds, and wading birds including, but not limited to, brown pelicans, ibis, herons, and terns. Invasive coin vine has degraded bird nesting and foraging habitat on EKNWR, and coin vine removal and restoration of scrub/shrub, coastal grasses, and other native plants would increase available bird nesting habitat for species that were injured by the DWH oil spill. The FL TIG anticipates ancillary benefits to sea turtles that nest on the island. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety. Project activities would occur in locations and during times when visitors could be avoided. Any chemical treatment or sand fence installation activities would be conducted by trained personnel and the public would not be involved. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
B3, Northeast Florida Coastal Predation Management (preferred)	*Cost-effectiveness*: The total estimated cost of $449,295 includes implementation of predator-control measures and indirect costs. The costs to carry out this alternative are based on similar projects and FWC's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Birds Restoration Type. The project has a clear nexus to spill injuries, as it would help compensate for losses to birds from the DWH oil spill, specifically American oystercatchers, least terns, and black skimmers. More specifically, nesting and foraging area stewardship activities, including predator management, align with restoration techniques identified in the DWH Strategic Framework for Bird Restoration Activities. *Likelihood of success*: This project utilizes effective predator-management methods to restore shorebird populations. This project builds off previously funded DWH projects, including the NRDA Enhanced Management of Avian Breeding Habitat Injured by Response Activities in the Florida Panhandle, Alabama, and Mississippi project and the NFWF-GEBF Restoring Florida's Shorebird & Seabird Populations project. The project would be implemented in an adaptive manner based on shorebird nesting monitoring data. Therefore, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: FWC and USDA-APHIS-WS have an extensive history with lethal and non-lethal predator control of avian and mammalian species. Activities would occur by trained personnel in accordance with permit conditions and standard predator-removal protocols to reduce the risk of collateral injury. *Benefits*: This project seeks to increase reproductive success and population size for Florida's focal shorebird and seabird species injured by the DWH oil spill through informed predation management. Monitoring data has demonstrated that predation is a leading cause of shorebird nest and seabird colony failure in Northeast Florida. Artificially inflated numbers of predators (due to proximity to human communities) and continued loss of beach-nesting bird habitat would continue to threaten bird species injured by the DWH oil spill unless mitigation efforts are implemented. The FL TIG expects this project to provide benefits to a variety of shorebird and seabird species, including, but not limited to, American oystercatchers, Wilson's plovers, and least terns. Ancillary benefits to sea turtle nests and hatchlings are likely to occur, in addition to potential benefits to young gopher tortoises. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety. Any predator removal or deterrent activities would be conducted by trained and permitted FWC and/or USDA-APHIS-WS personnel and the public would not be involved. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years (preferred)	*Cost-effectiveness*: The total estimated cost of $10,500,000 includes implementation of stewardship activities, monitoring, oversight, and indirect costs. If feasible, the FL TIG would leverage funding for this project with NFWF-GEBF and the RW TIG, which is currently planning restoration for birds. The costs to carry out this alternative are based on leveraging opportunities, similar projects, and FWC's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Birds Restoration Type. The project has a clear nexus to spill injuries, as it would help compensate for losses to birds from the DWH oil spill, specifically American oystercatchers, black skimmers, least terns, Wilson's plovers, and snowy plovers. More specifically, nesting and foraging area stewardship activities align with restoration techniques identified in the DWH Strategic Framework for Bird Restoration Activities. *Likelihood of success*: This project utilizes effective stewardship activities including reducing human disturbance, improving habitat quality, reducing predation, and improving regulatory coordination to restore shorebird and seabird populations. This project builds off work completed through the DWH NRDA Enhanced Management of Avian Breeding Habitat Injured by Response Activities in the Florida Panhandle, Alabama, and Mississippi project. The project would be adaptively implemented based on shorebird nesting monitoring data. Therefore, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: The FL TIG does not anticipate this project would cause collateral injury to natural resources. All activities would follow protocols to reduce disturbance of bird nesting and foraging habitat. *Benefits*: Through stewardship and conservation activities, this project seeks to increase reproductive success and population size for Florida's focal shorebird and seabird species injured by the DWH oil spill. The project would help continue the successful shorebird conservation work currently being implemented through the NFWF-GEBF Restoring Florida's Shorebird & Seabird Populations project, providing benefits to shorebirds and seabirds along Florida's Gulf Coast. Ancillary benefits to other species that utilize the same coastal habitat are expected, such as sea turtles. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety. Any predator removal or deterrent activities would be conducted by trained and permitted personnel and the public would not be involved. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	*Cost-effectiveness*: The total estimated cost of $21,000,000 includes implementation of stewardship activities, monitoring, oversight, and indirect costs. Efficiencies could be achieved by cost-sharing between this project and activities funded through NFWF-GEBF and the RW TIG, as proposed under B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years, which would also allow for more funds to be available for bird restoration by the FL TIG. *Goals and objectives*: This project is consistent with the Replenish and Protect Living Coastal and Marine Resources Restoration Goal and underlying Birds Restoration Type. The project has a clear nexus to spill injuries, as it would help compensate for losses to birds from the DWH oil spill, specifically American oystercatchers, black skimmers, least terns, Wilson's plovers and snowy plovers. More specifically, nesting and foraging area stewardship activities align with restoration techniques identified in the DWH Strategic Framework for Bird Restoration Activities. *Likelihood of success*: This project utilizes effective stewardship activities including reducing human disturbance, improving habitat quality, reducing predation, and improving regulatory coordination to restore shorebird and seabird populations. This project builds off work completed through the DWH NRDA Enhanced Management of Avian Breeding Habitat Injured by Response Activities in the Florida Panhandle, Alabama, and Mississippi project. The project would be adaptively implemented based on shorebird nesting monitoring data. Therefore, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: The FL TIG does not anticipate this project would cause collateral injury to natural resources. All activities would follow protocols to reduce disturbance of bird nesting and foraging habitat. *Benefits*: Through stewardship and conservation activities, this project seeks to increase reproductive success and population size for Florida's focal shorebird and seabird species injured by the DWH oil spill. The project would help continue the successful shorebird conservation work currently being implemented through the NFWF-GEBF Restoring Florida's Shorebird & Seabird Populations project, providing benefits to shorebirds and seabirds along Florida's Gulf Coast. Ancillary benefits to other species that utilize the same coastal habitat are expected, such as sea turtles. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety. Any predator removal or deterrent activities would be conducted by trained and permitted personnel and the public would not be involved. *Summary*: Based on the OPA evaluation, specifically for cost-effectiveness, this project was not identified as a preferred restoration alternative by the FL TIG in this RP/EA.

3.6 OPA Evaluation: Provide and Enhance Recreational Opportunities Alternatives

Table 3-5 provides an evaluation of the consistency with OPA criteria for each of the projects in the reasonable range of alternatives consistent with the Provide and Enhance Recreational Opportunities Restoration Goal and the underlying Provide and Enhance Recreational Opportunities Restoration Type. Additional information on the Provide and Enhance Recreational Opportunities alternatives is provided in Section 2.5.5.

Table 3-5 Evaluation of OPA criteria for the Provide and Enhance Recreational Opportunities alternatives

Alternatives	OPA Evaluation
REC1, Pensacola Community Maritime Park Public Fishing Marina (preferred)	*Cost-effectiveness*: The total estimated cost of $3,190,502 includes planning, design, permitting, construction, monitoring, oversight, indirect costs, and contingency funds. The costs to carry out this alternative are based on similar projects and FWC's experience, and, in the judgment of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Provide and Enhance Recreational Opportunities Restoration Goal and underlying Provide and Enhance Recreational Opportunities Restoration Type and has a clear nexus to recreational use injuries from the DWH oil spill. This project would provide new recreational opportunities in an area without a public fishing marina. The new marina would enhance/increase access to recreational fishing opportunities in the area, and the educational signage would enhance awareness of habitat conservation through pollution reduction, Pensacola's maritime history, and invasive species. *Likelihood of success*: This project includes planning and construction of marina amenities. Similar activities have been successfully implemented by FWC and the City of Pensacola in the past and have resulted in enhanced/increased recreational use. As such, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on enhancing/increasing recreational access through new water-access infrastructure. Appropriate BMPs and other measures would be utilized to minimize impacts to natural resources. *Benefits*: The primary benefit of this project is to provide and enhance recreational uses, specifically recreational fishing opportunities, through the construction of the proposed amenities. Ancillary benefits include enhancing/increasing public access to waterways for non-anglers. *Health and safety*: The FL TIG does not anticipate any adverse impacts to public health and safety. The marina has been designed and would be appropriately located to minimize boat traffic flows. Further, amenities would comply with ADA standards. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
REC2, Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades (preferred)	*Cost-effectiveness*: The total estimated cost of $1,402,531 includes planning, design, permitting, construction, monitoring, oversight, indirect costs, and contingency funds. The costs to carry out this alternative are based on similar projects and FWC's experience, and, in the judgment of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Provide and Enhance Recreational Opportunities Restoration Goal and underlying Provide and Enhance Recreational Opportunities Restoration Type and has a clear nexus to recreational use injuries from the DWH oil spill. More specifically, the pier, dock, and kayak launch would enhance/increase access to recreational fishing opportunities and the parking lots, education kiosks, and monofilament recycling bins would enhance visitor experiences. *Likelihood of success*: This project includes planning and construction of standard park amenities, activities that have been successfully implemented by FWC and the City of Pensacola in the past and have resulted in enhanced/increased recreational use. As such, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on enhancing/increasing recreational access through infrastructure improvements. Appropriate BMPs and other measures would be utilized to minimize impacts to natural resources. *Benefits*: The primary benefit of this project is to provide and enhance recreational uses, specifically recreational fishing opportunities, through the construction of the proposed amenities. Ancillary benefits include enhancing/increasing public access to waterways for non-anglers. *Health and safety*: The FL TIG does not anticipate any adverse impacts to public health and safety. In particular, the parking areas would be designed to minimize changes to traffic flows, and, consequently, only minor traffic impacts are anticipated. The addition of multiple ingress and egress points for kayakers would improve paddler safety. Finally, the enhanced amenities would also comply with ADA standards. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
REC3, Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements (preferred)	*Cost-effectiveness*: The total estimated cost of $353,100 includes planning, design, permitting, oversight, and contingency funds. The costs to carry out this alternative are based on similar projects and FDEP's experience, and, in the judgment of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Provide and Enhance Recreational Opportunities Restoration Goal and underlying Provide and Enhance Recreational Opportunities Restoration Type and has a clear nexus to recreational use injuries from the DWH oil spill. More specifically, the fishing pier, beach and water access sites, parking area, and pedestrian crossings would enhance/increase access to recreational fishing opportunities where infrastructure does not currently exist. *Likelihood of success*: This project includes planning, design, and permitting of standard park amenities, activities that have been successfully implemented by FDEP and Escambia County in the past and have resulted in enhanced/increased recreational use. As such, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project does not include construction activities (only E&D and permitting), therefore the FL TIG does not expect any impact to natural resources. *Benefits*: The primary benefit of this project is to provide and enhance recreational uses, specifically recreational fishing opportunities, through E&D and permitting of the proposed amenities. Funding for construction of these amenities could occur through future restoration plans. *Health and safety*: The FL TIG does not anticipate any adverse impacts to public health and safety as project activities include only E&D and permitting. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
REC4, Gulf Breeze Parks Boating and Fishing Access Upgrades (preferred)	*Cost-effectiveness*: The total estimated cost of $1,221,660 includes planning, design, permitting, construction, oversight, indirect costs, and contingency funds. The costs to carry out this alternative are based on similar projects and FWC's experience, and, in the judgment of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Provide and Enhance Recreational Opportunities Restoration Goal and underlying Provide and Enhance Recreational Opportunities Restoration Type and has a clear nexus to recreational use injuries from the DWH oil spill. The enhanced fishing pier, renovated and new boat docks and launches, walking paths, and monofilament recycling bins would enhance/increase access to recreational fishing opportunities and enhance visitors' recreational experiences. *Likelihood of success*: This project includes planning and construction of standard park amenities, activities that have been successfully implemented by FWC and the City of Gulf Breeze in the past and have resulted in enhanced/increased recreational use. As such, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on enhancing/increasing recreational opportunities through infrastructure improvements. Appropriate BMPs and other measures would be utilized to minimize impacts to natural resources. *Benefits*: The primary benefit of this project is to provide and enhance recreational uses, specifically recreational fishing opportunities, through the construction of proposed amenities. Ancillary benefits include enhancing/increasing public access to waterways for non-anglers. *Health and safety*: The FL TIG does not anticipate any adverse impacts to public health and safety. In particular, the parking area would be designed to minimize changes to traffic flows, and, consequently, only minor traffic impacts are anticipated. The enhanced amenities would also comply with ADA standards. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred alternative in this RP/EA.

Alternatives	OPA Evaluation
REC5, Lincoln Park Boat Ramp and Dock Improvements (preferred)	*Cost-effectiveness*: The total estimated cost of $457,500 includes construction, oversight, indirect costs, and contingency funds. The costs to carry out this alternative are based on similar projects and FWC's experience, and, in the judgment of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Provide and Enhance Recreational Opportunities Restoration Goal and underlying Provide and Enhance Recreational Opportunities Restoration Type and has a clear nexus to recreational use injuries from the DWH oil spill. The improved boat ramp and new docks would enhance/increase access to recreational fishing opportunities, and the expanded parking lot would enhance visitors' recreational experiences. *Likelihood of success*: This project includes planning and construction of standard park amenities, activities that have been successfully implemented by FWC and the City of Valparaiso in the past and have resulted in enhanced/increased recreational use. As such, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on enhancing/increasing recreational access through infrastructure improvements. Appropriate BMPs and other measures would be utilized to minimize impacts to other natural resources. *Benefits*: The primary benefit of this project is to provide and enhance recreational uses, specifically recreational fishing opportunities, through the construction of proposed amenities. Ancillary benefits include enhancing/increasing public access to waterways for non-anglers. *Health and safety*: The FL TIG does not anticipate any adverse impacts to public health and safety. The parking area would be designed to minimize changes to traffic flows, and, consequently, only minor traffic impacts are anticipated. Replacing the deteriorating existing launch is expected to improve public safety during recreational use. Further, the amenities would comply with ADA standards. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred)[50]	*Cost-effectiveness*: The total estimated cost of $5,720,000 includes acquisition of the parcel and implementation of minor recreational upgrades, monitoring, project oversight, and contingency funds. Part of the acquisition and the recreational improvements portion of the project ($2,500,000) are proposed for funding under the Provide and Enhance Recreational Opportunities Restoration Type. The costs to carry out this alternative are based on similar projects and DOI's experience, and, in the judgement of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Provide and Enhance Recreational Opportunities Restoration Goal and underlying Provide and Enhance Recreational Opportunities Restoration Type and has a clear nexus to recreational use injuries from the DWH oil spill. The recreational improvements, including the additional parking spaces, visitor contact station, and kayak launch, would improve access to recreational fishing opportunities and enhance visitors' recreational experiences. *Likelihood of success*: This project would include purchase of a privately-owned coastal parcel and minor recreational upgrades. Projects with land acquisition and similar recreational improvements have been successfully implemented in the past, including the DWH NRDA Florida Coastal Access Project. As such, the FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project would not likely cause collateral injury to natural resources. The project aims to mitigate impacts that may occur to coastal resources if the parcel were to sell to a developer, which would result in SVNWR needing to dredge Class II shellfish waters to gain new access to SVNWR. *Benefits*: The primary benefit of this portion of the project would be improved recreational access and experience, specifically recreational fishing opportunities. Recreational improvements at the site would enhance recreational experiences in an area of the Panhandle that is being rapidly developed, including providing new water access in a popular sportfishing location. These recreational improvements would also provide the first visitor contact station in sight of SVNWR. *Health and safety*: The FL TIG does not anticipate negative impacts to public health and safety. Because the parcel is one of few remaining green spaces on the Indian Pass peninsula, protecting this site would have public health benefits by providing a publicly available recreation area. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

[50] This project is also analyzed under the Habitat Projects on Federally Managed Lands Restoration Type.

Alternatives	OPA Evaluation
REC7, St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass	*Cost-effectiveness*: The total estimated cost of $3,218,988 includes planning, design, permitting, construction, monitoring, oversight, and contingency funds. The costs to carry out this alternative are based on similar projects and DOI's experience, and, in the judgment of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Provide and Enhance Recreational Opportunities Restoration Goal and underlying Provide and Enhance Recreational Opportunities Restoration Type and has a clear nexus to recreational use injuries from the DWH oil spill. More specifically, the new boat ramp would enhance/increase access to recreational fishing opportunities. The trail system, picnic areas, and observation deck would also enhance the public's recreational opportunities. *Likelihood of success*: This project includes planning and construction of standard recreational use amenities that are likely to be successfully implemented. However, the FL TIG is unsure of the likelihood of the project's success for enhancing recreational use until the project site is acquired and minor recreational improvements are implemented through the FM5/REC6, Indian Pass Land Acquisition and Minor Recreational Enhancements project proposed in this RP/EA. *Avoid collateral injury*: This project focuses on increasing and enhancing recreational access through infrastructure improvements. Appropriate BMPs and other measures would be utilized to minimize impacts to other natural resources. *Benefits*: The primary benefit of this project is to provide and enhance recreational uses, specifically recreational fishing opportunities, through the construction of proposed amenities. In addition, the observation deck would encourage the public to utilize recreational infrastructure for wildlife viewing, thereby reducing potential impacts to sensitive coastal habitats. While the FL TIG anticipates that this project would provide benefits to recreational use, if successfully implemented, the relative cost for the anticipated recreational use benefits is higher than the other Provide and Enhance Recreational Opportunities Restoration Type alternatives in this RP/EA. *Health and safety*: The FL TIG does not anticipate any adverse impacts to public health and safety. The amenities would comply with ADA standards. *Summary*: Based on the OPA evaluation, specifically for the benefits compared with other restoration alternatives, this project was not identified as a preferred restoration by the FL TIG in this RP/EA.

Alternatives	OPA Evaluation
REC8, Florida Artificial Reef Creation and Restoration – Phase 2 (preferred)	*Cost-effectiveness*: The total estimated cost of $10,342,500 includes planning, design, permitting, construction, monitoring, oversight, and indirect costs. The costs to carry out this alternative are based on similar projects, including the DWH NRDA Florida Artificial Reef Creation and Restoration project (i.e., Phase 1) and FWC's experience, and, in the judgment of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Provide and Enhance Recreational Opportunities Restoration Goal and underlying Provide and Enhance Recreational Opportunities Restoration Type and has a clear nexus to recreational use injuries from the DWH oil spill. Constructing artificial reefs would enhance/increase recreational fishing opportunities throughout the Panhandle. *Likelihood of success*: This project includes planning and construction of standard artificial reef structures that are likely to be successfully implemented. This project builds off successful partnerships developed during Phase 1. The FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on enhancing recreational experiences through placement of artificial reef materials. Appropriate BMPs and other measures would be utilized to minimize impacts to other natural resources. *Benefits*: The primary benefit of this project is to provide and enhance recreational fishing opportunities in Florida through the construction of artificial reefs. Reef fish expected to benefit from increased habitat areas include amberjack, red snapper, vermilion snapper, triggerfish, kingfish, cobia, gag grouper, and scamp grouper. *Health and safety*: The FL TIG does not anticipate any adverse impacts to public health and safety. The artificial reef locations would be sited to minimize risk of vessel collision. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

Alternatives	OPA Evaluation
REC9, Apollo Beach Recreational Sportfish Hatchery Facility (preferred)	*Cost-effectiveness*: The total estimated cost of $4,620,000 includes planning, design, permitting, construction, oversight, indirect costs, and contingency funds. The costs to carry out this alternative are based on similar projects and FWC's experience, and, in the judgment of the FL TIG, are reasonable and appropriate. *Goals and objectives*: This project is consistent with the Provide and Enhance Recreational Opportunities Restoration Goal and underlying Provide and Enhance Recreational Opportunities Restoration Type and has a clear nexus to recreational use injuries from the DWH oil spill. More specifically, this project would enhance recreational fishing opportunities by constructing a fish production facility that would be used to stock popular sportfishing locations along Florida's Central Gulf Coast. *Likelihood of success*: This project includes planning and construction of standard aquaculture facilities, activities that have been successfully implemented by FWC in the past and have resulted in increased fish production and enhanced recreational use. The FL TIG anticipates this project would have a high likelihood of success. *Avoid collateral injury*: This project focuses on increasing and enhancing recreational access through sportfish aquaculture. Appropriate BMPs and other measures would be utilized to minimize impacts to natural resources. *Benefits*: The primary benefit of this project is to provide and enhance recreational fishing opportunities through the construction of a fish production/hatchery facility. *Health and safety*: The FL TIG does not anticipate any adverse impacts to public health and safety. The constructed facilities would comply with ADA standards, and fish production activities would be conducted by trained FWC personnel. *Summary*: Based on the OPA and NEPA evaluations, this project was identified as a preferred restoration alternative in this RP/EA.

3.7 Natural Recovery

Pursuant to the OPA NRDA regulations, the 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" (40 CFR § 990.53[b][2]). Under this alternative, no additional restoration would be done by the FL TIG to accelerate the recovery of habitat on federally managed lands, sea turtles, marine mammals, birds, or recreational losses in the Florida Restoration Area using DWH NRDA funding at this time. The FL TIG would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to 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 within the PDARP/PEIS. Based on this determination, tiering this RP/EA from the PDARP/PEIS, and incorporating that analysis by reference, the FL TIG did not find natural recovery to be a viable alternative under OPA. Natural recovery is not considered further in this RP/EA.[51]

3.8 Project Costs

The estimated costs for each restoration project evaluated in this RP/EA are provided in Table 2-2 and discussed in the project descriptions in Section 2.5. The total estimated cost for projects proposed under each Restoration Type is as follows:

- Habitat Projects on Federally Managed Lands: $14,982,930 ($13,733,000 for the preferred alternatives);
- Sea Turtles: $7,709,908 ($6,217,208 for the preferred alternatives);
- Marine Mammals: $7,399,300 ($5,000,000 for the preferred alternative);
- Birds: $34,164,077 ($13,164,077 for the preferred alternatives); and
- Provide and Enhance Recreational Opportunities: $27,306,781 ($24,087,793 for the preferred alternatives).

For the one E&D project (REC3, Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements), the estimated cost includes planning, E&D, and/or other activities needed to facilitate development of the potential project that could be considered by the FL TIG for implementation in a future restoration plan. For the remaining projects, proposed for full implementation, estimated costs reflect all costs associated with implementing the project, including but not limited to updating E&D materials, additional E&D activities, construction, monitoring, evaluation, Trustee oversight, management, and/or contingencies. These cost estimates reflect the most current designs and information available to the FL TIG at the time of drafting this RP/EA.

[51] NEPA requires evaluation of a "no action" alternative. This differs from the natural recovery alternative under OPA. The environmental consequences of the NEPA no action alternative is considered separately in Chapter 4.

3.9 Monitoring Requirements

Trustees establish restoration objectives that are specific to the natural resources that were injured (15 CFR § 990.55(b)(2)). These objectives should clearly specify the desired outcome and the performance criteria by which successful restoration would be determined, including criteria that would necessitate corrective actions (15 CFR § 990.55(b)(2)).

In the PDARP/PEIS, the DWH Trustees identified "Monitoring, Adaptive Management, and Administrative Oversight" as a Restoration Goal (DWH Trustees 2016a). As described in Chapter 5, Appendix E of the PDARP/PEIS, the Trustees committed to a MAM Framework that incorporates the best available science into planning and design of the alternative, identifies and reduces key uncertainties, tracks and evaluates progress toward Restoration Goals, and determines the need for corrective actions (DWH Trustees 2017a). The MAM Framework provides a flexible, science-based approach to implement and monitor restoration.

The FL TIG developed draft MAM plans for each of the preferred alternatives that include implementation identified in this RP/EA (Appendix B). These MAM plans outline the monitoring needed to evaluate each alternative's progress toward meeting site-specific objectives, the appropriate corrective actions, and adaptive management where applicable. The plans included in Appendix B are consistent with the requirements and guidelines set forth in the PDARP/PEIS (DWH Trustees 2016a), the Trustee Council SOPs (DWH Trustees 2016b), and the Trustees' MAM Manual (DWH Trustees 2017a). Monitoring goals, objectives, parameters, potential corrective actions, and monitoring schedules are included. The MAM plans are intended to be updated as needed to reflect changing conditions and to incorporate new information as it becomes available. For example, if initial data analysis indicates that the sampling design for the alternative is inadequate, or if any uncertainties are resolved or new uncertainties are identified during implementation and monitoring of the alternative, the plan may need to be revised. Updates to MAM plans and any additional details concerning the status of monitoring activities would be made publicly available through DIVER.

3.10 Best Management Practices

As part of the environmental compliance process, federal regulatory agencies provide guidance on BMPs such as project design criteria (PDC), lessons learned, expert advice, and tips from the field. DWH Trustees incorporate appropriate BMPs into planning and design to avoid or minimize impacts on natural resources, including protected and listed species and their habitats. BMPs are identified in required permits, consultations, or environmental reviews, including those described in Appendix 6.A of the PDARP/PEIS (DWH Trustees 2016a).

3.11 OPA Evaluation Conclusions

As described in the sections above, the FL TIG conducted an OPA evaluation of each of the projects included in the reasonable range of alternatives for this RP/EA. All 19 of the preferred restoration alternatives are consistent with the PDARP/PEIS Restoration Goals and Types and the six OPA evaluation criteria the Trustees utilized as set forth in 990.54(a)(1)-(6). The one preferred E&D alternative is intended to generate information necessary to design and implement potential future restoration

activities. This project would not directly restore natural resources or their services but would provide information needed to effectively do so in the future.

A summary of the OPA evaluation is provided in Table 3-6.

Table 3-6 Summary of OPA evaluation for reasonable range of alternatives

Alternatives	OPA Evaluation Summary
Restoration Type:	**Habitat Projects on Federally Managed Lands (FM)**
FM1, Johnson Beach Access Management and Habitat Protection (preferred)	The estimated project costs are reasonable and appropriate. This project would protect and enhance dune habitat at GUIS by reducing visitor impacts on this sensitive habitat. This project would build off successful visitor management work at GUIS funded by the FL TIG's RP1/EA. This project is likely to be successful and would avoid collateral injury through the use of conservation measures and monitoring of protected resources. The proposed amenities to manage visitor use (dedicated parking lots, new crosswalks and dune crossovers, including one ADA-compliant dune crossover, and conversion of a portion of the road to a bicycle-pedestrian-only path) would improve safety at Johnson Beach by reducing vehicle congestion and roadside parking. This project was identified as a preferred restoration alternative by the FL TIG.
FM2, Perdido Key Sediment Placement (preferred)	The estimated project costs are reasonable and appropriate. This project would enhance beach and dune habitat at GUIS by placing dredged material to partially supplement the sediment budget at the Perdido Key Unit of GUIS. This project uses standard beach nourishment methods, is likely to be successful, and would avoid collateral injury through the use of conservation measures. This project was identified as a preferred restoration alternative by the FL TIG.
FM3, Old Fort Pickens Road Utility Line Relocation	The estimated project costs are reasonable and appropriate. This project would build off NPS' road relocation project in the same location and is likely to be implemented successfully and without collateral injury. However, this project would not provide as many direct benefits to resources injured by the DWH oil spill as the other alternatives. For this reason, this project was not identified as a preferred restoration alternative by the FL TIG in this RP/EA.
FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits (preferred)	The estimated project costs are reasonable and appropriate. This project would build off previous DWH NRDA lighting retrofit projects and is anticipated to be implemented successfully and with minimal collateral injury. This project would reduce light pollution on GUIS beach habitat, benefitting a variety of coastal wildlife including beach-nesting sea turtles and birds. This project was identified as a preferred restoration alternative by the FL TIG.
FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred)[52]	The estimated project costs for the proposed land acquisition are reasonable and appropriate. This project would secure permanent access to SVNWR enabling staff to more effectively manage its habitats and wildlife. Land acquisitions are commonly implemented conservation measures on federally managed lands, and this project is anticipated to be implemented successfully with minimal collateral injury. Land acquisition under this proposed project was identified as a preferred restoration alternative by the FL TIG.

[52] This project is jointly proposed under two Restoration Types: Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities. Only the activities funded by the Habitat Projects on Federally Managed Lands Restoration Type (land acquisition) are analyzed here. The recreational improvements funded under the Provide and Enhance Recreational Opportunities Restoration Type are analyzed in the corresponding table below.

Alternatives	OPA Evaluation Summary
Restoration Type:	**Sea Turtles (ST)**
ST1, Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast (preferred)	The estimated project costs are reasonable and appropriate. This project would help restore sea turtle populations injured by the DWH oil spill by developing and implementing conservation measures to reduce sea turtle injury and mortality from interactions with hook-and-line fishing gear. Conservation measures would be developed collaboratively through the use of best available science, observational information that would be collected during the project, and expert working groups. As such, the FL TIG anticipates that this project would be implemented successfully with minimal collateral injury or impacts to human health and safety. This project was identified as a preferred restoration alternative by the FL TIG.
ST2, Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast (preferred)	The estimated project costs are reasonable and appropriate. This project would help restore sea turtle populations injured by the DWH oil spill by preventing the accumulation of and removing in-water marine debris. Other marine debris prevention and removal programs have been implemented successfully by FWC and partners. As such, the FL TIG anticipates that this project would be implemented successfully, would avoid collateral injury through the use of appropriate BMPs, and would benefit multiple marine species that are at risk of entanglement or entrapment in marine debris. This project was identified as a preferred restoration alternative by the FL TIG.
ST3, Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast (preferred)	The estimated project costs are reasonable and appropriate. This project would help restore sea turtle populations injured by the DWH oil spill by developing and implementing a public awareness campaign to reduce sea turtle injury and mortality from vessel strikes. The public awareness campaign would be developed from observational information that would be collected during the project. As such, the FL TIG anticipates that this project would be implemented successfully with minimal collateral injury or impacts to human health and safety. This project was identified as a preferred restoration alternative by the FL TIG.
ST4, Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast	The estimated project costs are reasonable and appropriate. This project would help restore sea turtle populations injured by the DWH oil spill by removing land-based debris that act as barriers to sea turtle nesting and hatchling success. The FL TIG believes that this project would be best implemented after additional coordination with the RW TIG, which is also planning sea turtle restoration. For this reason, this project was not identified as a preferred restoration alternative by the FL TIG in this RP/EA.
Restoration Type:	**Marine Mammals (MM)**
MM1, Florida Gulf Coast Marine Mammal Stranding Network (preferred)	The estimated project costs are reasonable and appropriate. This project would help restore marine mammal populations injured by the DWH oil spill by maintaining current Florida MMSN capabilities, which would improve early detection and mitigation of threats and understanding of key causes of morbidity and mortality. Based on the long, successful history of the Florida MMSN, the FL TIG anticipates this project would be implemented successfully, would have minimal collateral injury, and would benefit multiple marine mammal species. This project was identified as a preferred restoration alternative by the FL TIG.

Alternatives	OPA Evaluation Summary
MM2, Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities	The estimated project costs are reasonable and appropriate. The project includes development of an outreach and education strategy aimed at reducing lethal impacts to dolphins from illegal feeding activities. Although the project activities are anticipated to be implemented successfully, it is unclear the extent to which the project activities would result in a decrease in illegal feeding events across Florida's Gulf Coast. The FL TIG prefers to spend its limited Marine Mammals Restoration Type allocation on projects likely to provide direct benefits to marine mammals, such as the benefits that would be achieved through MM1, Florida Gulf Coast Marine Mammal Stranding Network. For these reasons, this project was not identified as a preferred restoration alternative by the FL TIG in this RP/EA.
Restoration Type:	**Birds (B)**
B1, Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers (preferred)	The estimated project costs are reasonable and appropriate. This project would restore bird populations injured by the DWH oil spill (specifically American oystercatchers) by restoring and enhancing bird nesting and foraging habitat (specifically oyster reefs). This project builds off successful NFWF-GEBF oyster restoration work in Florida's Big Bend region. Thus, the FL TIG anticipates this project would also be implemented successfully with minimal collateral impacts or impacts to human health and safety. This project is likely to provide ancillary benefits to oyster reef habitats and other shorebirds and seabirds. This project was identified as a preferred restoration alternative by the FL TIG.
B2, Egmont Key Vegetation Management and Dune Retention (preferred)	The estimated project costs are reasonable and appropriate. This project would restore bird populations injured by the DWH oil spill (specifically shorebirds and wading birds) by improving bird nesting habitat through vegetation management and beach restoration. This project builds off previous EKNWR work removing coin vine and nourishing the island's west-facing beach. As such, the FL TIG anticipates this project would be implemented successfully with minimal collateral injury or impacts to human health and safety. This project is likely to provide ancillary benefits to other bird guilds as well as sea turtles that nest on Egmont Key. This project was identified as a preferred restoration alternative by the FL TIG.
B3, Northeast Florida Coastal Predation Management (preferred)	The estimated project costs are reasonable and appropriate. This project would restore bird populations injured by the DWH oil spill (specifically American oystercatchers, least terns, and black skimmers) through targeted predator management at nesting and foraging sites. FWC has an extensive history of successfully managing predator communities with minimal collateral injury or impacts to human health and safety. As such, the FL TIG anticipates this project would be implemented successfully and would benefit a variety of shorebird and seabird species as well as sea turtles and young gopher tortoises. This project was identified as a preferred restoration alternative by the FL TIG.
B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years (preferred)	Through various stewardship and management activities, this project would protect and restore a variety of seabird and shorebird species injured by the DWH oil spill. This project leverages funds from NFWF-GEBF over the duration of the project. Additional coordination with the RW TIG, which is also planning bird restoration, is anticipated. Therefore, the estimated project costs are reasonable and appropriate. This project would support FWC's existing successful program managing shorebirds and seabirds in Florida. The FL TIG anticipates this project would be implemented successfully, would avoid collateral injury and impacts to human health and safety, and would benefit a variety of shorebird and seabird species. This project was identified as a preferred restoration alternative by the FL TIG.

Alternatives	OPA Evaluation Summary
B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	Through various stewardship and management activities, this project would protect and restore a variety of seabird and shorebird species injured by the DWH oil spill. This project would support FWC's existing successful program managing shorebirds and seabirds in Florida. The FL TIG anticipates this project would be implemented successfully, would avoid collateral injury and impacts to human health and safety, and would benefit a variety of shorebird and seabird species. While the estimated project costs for 10 years are reasonable and appropriate, efficiencies could be achieved by cost-sharing and coordination with activities and bird restoration planning funded through NFWF-GEBF, the RW TIG, and other potential DWH-funding sources. For this reason, this project was not identified as a preferred restoration alternative by the FL TIG in this RP/EA.
Restoration Type:	**Provide and Enhance Recreational Opportunities (REC)**
REC1, Pensacola Community Maritime Park Public Fishing Marina (preferred)	The estimated project costs are reasonable and appropriate. This project would enhance/increase access to recreational fishing opportunities by constructing a day-use fishing marina. The FL TIG anticipates this project would be implemented successfully with minimal collateral injury or impacts to human health and safety. This project was identified as a preferred restoration alternative by the FL TIG.
REC2, Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades (preferred)	The estimated project costs are reasonable and appropriate. This project would enhance recreational fishing opportunities and increase access to waterways by constructing a pier, dock, kayak launch, and various educational elements. The FL TIG anticipates this project would be implemented successfully with minimal collateral injury or impacts to human health and safety. This project was identified as a preferred restoration alternative by the FL TIG.
REC3, Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements (preferred)	The estimated project costs are reasonable and appropriate. This project would enhance recreational fishing opportunities and increase access to waterways by engineering, designing, and permitting a fishing pier, beach and water access sites, a parking area, and pedestrian-road crossings. Since this project is only for E&D and permitting of the proposed amenities, the FL TIG does not expect any impact to natural resources or human health and safety. The E&D and permitting activities are anticipated to be implemented successfully. This project was identified as a preferred restoration alternative by the FL TIG.
REC4, Gulf Breeze Parks Boating and Fishing Access Upgrades (preferred)	The estimated project costs are reasonable and appropriate. This project would enhance recreational fishing opportunities and increase access to waterways by constructing boat docks and launches and enhancing an existing fishing pier. Similar types of recreational amenities have increased/enhanced recreational experiences in the area. As such, the FL TIG anticipates this project would have a high likelihood of success and would have minimal collateral injury or impact to human health and safety. This project was identified as a preferred restoration alternative by the FL TIG.
REC5, Lincoln Park Boat Ramp and Dock Improvements (preferred)	The estimated project costs are reasonable and appropriate. This project would enhance recreational fishing opportunities and increase access to waterways by replacing boat docks and launches at an existing park. Similar types of recreational amenities have increased/enhanced recreational experiences in the area. As such, the FL TIG anticipates this project would have a high likelihood of success and would have minimal collateral injury or impact to human health and safety. This project was identified as a preferred restoration alternative by the FL TIG.

Alternatives	OPA Evaluation Summary
FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred)[53]	The estimated project costs related to the Provide and Enhance Recreational Opportunities Restoration Type (specifically a portion of the land acquisition and construction of the proposed parking lot expansion, visitor contact station, and kayak launch) are reasonable and appropriate. This project would enhance recreational fishing opportunities and increase access to waterways in an area of the Florida Panhandle experiencing rapid coastal development. DOI and the FL TIG have previously implemented similar recreational upgrades on acquired coastal parcels. As such, the FL TIG anticipates this project would be successful with minimal impact to natural resources or human health and safety. This project was identified as a preferred restoration alternative by the FL TIG.
REC7, St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass	This project would enhance recreational fishing opportunities and increase access to waterways in an area of the Florida Panhandle experiencing rapid coastal development. This project proposes to construct a trail system, picnic areas, and an observation deck and replace the existing boat ramp at the Indian Pass parcel that would be acquired under FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass. While the FL TIG anticipates these amenities would be implemented successfully, the expected level of recreational benefit for the estimated costs is lower compared to other proposed alternatives under this Restoration Type. The FL TIG anticipates this project would be more successful when recreational use needs are better understood after the implementation of FM5/REC6. For these reasons, this project was not identified as a preferred restoration alternative by the FL TIG in this RP/EA.
REC8, Florida Artificial Reef Creation and Restoration – Phase 2 (preferred)	The estimated project costs are reasonable and appropriate. This project would enhance recreational fishing opportunities by creating and enhancing artificial reefs. This project would build off successful work completed in the DWH NRDA Phase I project. As such, the FL TIG anticipates this project would be implemented successfully with minimal impact to natural resources or human health and safety. Ancillary benefits to fish species through increased habitat area are anticipated. This project was identified as a preferred restoration alternative by the FL TIG.
REC9, Apollo Beach Recreational Sportfish Hatchery Facility (preferred)	The estimated project costs are reasonable and appropriate. This project would enhance recreational fishing opportunities through the construction of a fish production/hatchery facility. The FL TIG anticipates this project would be implemented successfully with minor impacts to natural resources or human health and safety. This project was identified as a preferred restoration alternative by the FL TIG.

Based on the OPA evaluations summarized above and information and analyses presented in this RP/EA, the FL TIG proposes to proceed with the 19 preferred alternatives (identified as 'Preferred' in Table 3-6). At this time, the FL TIG does not intend to proceed further with the five alternatives that were not identified as preferred.

[53] This project is jointly proposed under two Restoration Types: Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities. Only the activities funded by the Provide and Enhance Recreational Opportunities Restoration Type (recreational improvements) are analyzed here. The land acquisition funded under the Habitat Projects on Federally Managed Lands Restoration Type are analyzed in the corresponding table above.

CHAPTER 4 ENVIRONMENTAL ASSESSMENT

4.1 Overview of NEPA Approach

This chapter describes the anticipated environmental impacts of the proposed action (implementation of the preferred alternatives) and the alternatives not preferred for implementation. The NEPA analysis[54] presented in this chapter is consistent with the PDARP/PEIS and tiers where applicable. Resources analyzed and impacts definitions (minor, moderate, major) align with the PDARP/PEIS (Appendix C).[55] The PDARP/PEIS is incorporated by reference.

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

Incorporation by reference of relevant information from existing NEPA analyses or other material is used to streamline the NEPA process and to present a concise document that provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or finding of no significant impact, and to aid the FL TIG's compliance with NEPA (40 CFR § 1506.3, 40 CFR § 1508.9). Agencies should "focus on significant environmental issues" and for other than significant issues there should be "only enough discussion to show why more study is not warranted" (40 CFR §§ 1502.1 and 1502.2). All source documents relied upon for the NEPA analyses are available to the public and links are provided in the discussion of the environmental consequences where applicable.

This chapter addresses direct, indirect, and cumulative impacts of proposed alternatives. Section 6.6 and Appendix 6.B of the PDARP/PEIS (Cumulative Impacts) are incorporated by reference into the cumulative impacts analysis, including the methodologies for assessing cumulative impacts, identification of affected resources, and the cumulative impacts scenario. Further, brief project descriptions focusing on activities that would result in environmental impacts are provided in the sections below, but complete project descriptions for each alternative are provided in Chapter 2.

This chapter is organized to describe impacts in a manner to avoid redundancy and unnecessary information by discussing activities that do not require further NEPA analysis in Section 4.2, analyzing

[54] The FL TIG began developing the environmental assessment for this RP/EA before the September 14, 2020 effective date for CEQ's Update to the NEPA Regulations. Therefore, as permitted by the Update, the FL TIG prepared the environmental assessment under the 1978 CEQ NEPA regulations that were in effect prior to the Update. 40 C.F.R. § 1506.13.

[55] Physical Resources: Geology and Substrates, Hydrology and Water Quality, Air Quality, Noise; Biological Resources: Habitats, Wildlife Species (Including Birds), Marine and Estuarine Fauna (Fish, Shellfish, Benthic Organisms), Protected Species; Socioeconomic Resources: Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Tourism and Recreational Use, Fisheries and Aquaculture, Marine Transportation, Aesthetics and Visual Resources, Public Health and Safety, including Flood and Shoreline Protection.

resources with similar impacts across alternatives together in Section 4.3, and focusing impacts that differ across alternatives in the separate project sections in the remainder of the Chapter.

4.2 Activities that Do Not Require Further NEPA Analysis

This section describes impacts from project activities that are fully analyzed in the PDARP/PEIS and require no additional NEPA analysis. These include engineering and design, data gathering, and educational activities.

4.2.1 Engineering and Design

As discussed in the PDARP/PEIS (Chapter 6), a TIG may propose funding an E&D phase in a plan for a conceptual project, or for studies needed to maximize restoration planning efforts. This would allow the TIG to develop sufficient project information to develop a more detailed analysis in a subsequent restoration plan, or for use during restoration planning. The FL TIG proposes one E&D project in the reasonable range of alternatives: REC3, Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements (preferred). After review, the FL TIG determines that the environmental consequences that may result from this project fall within the range of impacts described in Section 6.4.14 of the PDARP/PEIS, which provides the NEPA analysis for this alternative, and is incorporated by reference and summarized below. Additional details on this project are provided in Chapter 2.

4.2.1.1 Environmental Consequences

REC3 includes E&D and permitting activities for a new ADA-accessible fishing pier as well as E&D for additional access improvements such as parking, pedestrian crossings, beach and water access, and an ADA-accessible kayak launch. Environmental consequences that may occur as a result of these actions fall within the range of impacts described in Section 6.4.14 of the PDARP/PEIS. In particular, the PDARP/PEIS recognizes that project planning, design and engineering, and permitting activities are intended to support the development of projects to propose in more detail in subsequent restoration plans. Some preliminary phases of project planning would cause direct, short-term, minor adverse impacts through associated fieldwork. Temporary adverse impacts to the biological and physical environment also could include short-term disturbance of habitats and species and minor disturbance to terrestrial, estuarine, and marine environments. The REC3 E&D project is anticipated to require only minimal field work, such as any surveys required for design and permitting, and little to no ground disturbance. If subsequent phases of this project are later proposed for implementation with DWH NRDA funds, a NEPA analysis of construction impacts would be included in the associated restoration plan.

4.2.2 Data Gathering and Educational Activities

As discussed in the PDARP/PEIS (Chapter 6), projects may include educational activities (i.e., elements that promote environmental stewardship, education, and outreach) such as creating or enhancing natural-resource-related education facilities and programs; designing and installing educational signage and other materials; and developing other means of public outreach and engagement. Furthermore, some data-related activities include gathering, compiling, and evaluating information to improve understanding of natural resources and in turn future restoration efforts.

The FL TIG proposes several projects in this RP/EA that include data gathering and educational activities. These activities are summarized for each alternative below. In some cases, these data-gathering and educational activities are designed specifically for a resource or Restoration Type (e.g., Sea Turtles, Birds) or to reach targeted user groups. In other cases, these activities more generally promote environmental conservation and stewardship.

The following project includes only data-gathering or educational activities, and as such, is not analyzed further in subsequent sections.

- MM2, Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities; *conduct social science surveys, collect and evaluate social science data, develop education materials, conduct outreach*.

The following projects include data-gathering and educational activities as part of a larger project. The remaining project activities are analyzed in the sections below.

- FM1, Johnson Beach Access Management and Habitat Protection (preferred); *install educational signage*.
- ST1, Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast (preferred); *collate existing information, convene expert working group, develop educational resources*.
- ST2, Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast (preferred); *provide educational presentations, install educational signage, develop outreach materials*.
- ST3, Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast (preferred); *collate existing information, educate the public*.
- ST4, Removal of Barriers on Sea Turtle Nesting Beach Habitat along Florida's Gulf Coast; *develop educational materials, conduct outreach*.
- MM1, Florida Gulf Coast Marine Mammal Stranding Network (preferred); *collect and evaluate stranding and necropsy data*.
- B3, Northeast Florida Coastal Predation Management (preferred); *install educational signage*.
- B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years (preferred); *collate existing information, evaluate monitoring data, conduct education and outreach, provide training*.
- B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years; *collate existing information, evaluate monitoring data, conduct education and outreach, provide training*.
- REC1, Pensacola Community Maritime Park Public Fishing Marina (preferred); *install educational signage*.
- REC2, Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades (preferred); *install educational signage*.

- FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred); *install educational signage, increase availability of educational information.*

4.2.2.1 Environmental Consequences

The data gathering and educational elements of the alternatives proposed in this RP/EA are expected to increase appreciation for, and awareness and understanding of the status of vulnerable ecological resources in Florida. These activities would involve little or no disturbance of physical or biological resources. Implementing surveys and analyzing data are typically conducted from existing facilities. Installation of signage could displace very small areas of upland soil or vegetation; however, signage would be placed in areas that are already developed and away from sensitive resources. No short- or long-term negative impacts are anticipated for socioeconomic resources. Implementing these activities is anticipated to result in long-term benefits to biological resources. The benefits would result from educating youth and local communities about natural resources, environmental issues, and conservation.

After review, the FL TIG determined that the environmental consequences of the data-gathering and educational activities included in these alternatives fall within the range of impacts described in Section 6.4.14 of the PDARP/PEIS. The complete project descriptions for these alternatives are provided in Chapter 2 (Section 2.5). No additional analysis on the environmental consequences of the data-gathering and educational activities is necessary.

4.3 Resources with Similar Impacts Common to All Alternatives

Alternatives included in the reasonable range in this RP/EA were reviewed to determine whether any resources would experience similar minor adverse impacts common to all alternatives, no impact, or negligible impacts not requiring detailed analysis. The subset of resource categories that experience no impacts to minor adverse impacts similarly across all alternatives are described in this section once rather than repeated throughout the sections applicable to each alternative (see list of resource categories below). Resource categories where impacts are distinct and specific to the individual alternative are described in their respective sections (see Section 4.3).

- **Physical Resources** – Floodplains and Wetlands, Air Quality and Greenhouse Gas Emissions, Noise
- **Socioeconomic Resources** – Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, Marine Transportation

4.3.1 Physical Resources

4.3.1.1 Floodplains and Wetlands

Floodplains and wetlands are a subset of the hydrology and water quality resource category. Adverse impacts to floodplains are defined as detectable changes to the natural and beneficial floodplain and

increased risk of flood loss including impacts on human safety, health, and welfare. Adverse impacts to wetlands are defined as measurable impacts on the size, integrity, or connectivity of wetlands and wetland function. All project activities proposed in this RP/EA would avoid wetland areas. Project activities would not appreciably change the elevation of the project location and would therefore not negatively impact flood elevations. Further, the projects in this RP/EA would not significantly increase impervious surface areas compared to current conditions. As such, the projects in this RP/EA are not anticipated to have any adverse impacts on floodplains or wetlands.

4.3.1.2 Air Quality and Greenhouse Gas Emissions

USEPA defines ambient air in 40 C.F.R. Part 50 as "that portion of the atmosphere, external to buildings, to which the general public has access." In compliance with the 1970 Clean Air Act and the 1977 and 1990 Clean Air Act Amendments, USEPA has promulgated National Ambient Air Quality Standards (NAAQS). The NAAQS include primary standards which set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. To date, USEPA has issued NAAQS for six criteria air pollutants: carbon monoxide, sulfur dioxide, particle pollution (for particles with a diameter less than or equal to a nominal 10 microns and with a diameter less than or equal to a nominal 2.5 microns), ozone, nitrogen dioxide, and lead.[56] Individual states may promulgate their own ambient air quality standards for these "criteria" pollutants, provided that they are at least as stringent as the federal standards. None of the projects are located in a county currently listed on USEPA's nonattainment counties for any criteria pollutant (USEPA 2020).

Greenhouse gases (GHGs) are chemical compounds found in the Earth's atmosphere that absorb and trap infrared radiation as heat. The principal GHGs emitted into the atmosphere through human activities are carbon dioxide, methane, nitrous oxide, and fluorinated gases, which are described in more detail below.

- Carbon dioxide enters the atmosphere through burning fossil fuels (coal, natural gas, and oil) solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacturing of cement). Carbon dioxide is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes.

[56] Information on the criteria air pollutants is available here: www.epa.gov/criteria-air-pollutants. The criteria air pollutants can harm your health and the environment, and cause property damage. Sections 108 and 109 of the Clean Air Act govern the establishment, review, and revision, as appropriate, of the NAAQS for each criteria air pollutant to provide protection for the nation's public health and the environment.

- Fluorinated gases are sometimes used as substitutes for stratospheric ozone-depleting substances (e.g., chlorofluorocarbons, hydrochlorofluorocarbons, halons).

The PDARP/PEIS (Chapter 6) found that short-term, minor to moderate adverse impacts to air quality may occur during construction associated with projects under the Habitat Projects on Federally Managed Lands, Sea Turtles, Marine Mammals, Birds, and Provide and Enhance Recreational Opportunities Restoration Types. Past project-specific NEPA evaluations of DWH restoration projects in the Gulf similar to those proposed in this RP/EA found that project impacts would be consistent with the PDARP/PEIS findings.

Alternatives in this RP/EA are anticipated to involve construction activities, local transport of personnel conducting project activities, and vehicle and vessel transportation for implementation and construction. As such, adverse air quality impacts would be expected to be localized and occur primarily during active construction activities from emissions generated by construction equipment and vehicles. Engine exhaust from construction equipment and other vehicles would contribute to an increase in criteria air pollutants, GHGs, and other air pollutants. Because of the small scale and short duration of the construction portion of the applicable alternatives, and the low level of increased vehicle traffic anticipated to be generated by the projects, emissions are expected to be minor and short-term, with only minor and long-term adverse effects associated with increased emissions from new visitor vehicles for some of the Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities projects. These activities are not expected to cause an exceedance of the NAAQS, even when considered cumulatively with other area emissions. Therefore the short- and long-term impacts across project types included in this RP/EA would most likely result in negligible to minor long-term adverse impacts.

4.3.1.3 Noise

The PDARP/PEIS (Chapter 6) states the primary sources of terrestrial noise in the coastal environment are transportation and construction-related activities, which is consistent with areas affected by this RP/EA. The primary sources of ambient (background) noise in the project areas for this RP/EA are operation of vehicles, humans, recreational boating vessels, and natural sounds such as wind and wildlife. The level of noise in the project areas vary depending on the season, time of day, number and types of noise sources, and distance from the noise source.

The PDARP/PEIS (Chapter 6) found that adverse impacts to ambient noise associated with most Restoration Approaches relevant to this RP/EA would be minor to moderate in the short-term, with minor long-term impacts associated with increased visitation and vehicle use. The PDARP/PEIS noted that restoring and enhancing dunes and beaches and protect and conserve marine, coastal, estuarine, and riparian habitats could increase local noise levels temporarily, and minor to major adverse impacts from noise may occur during any construction activities. The severity of these adverse physical impacts was anticipated to depend to a large degree on the location of the project, the amount of disturbance that these activities would generate, and the distance to sensitive receptors such as recreational users or wildlife. Past project-specific NEPA evaluations of DWH restoration projects in Florida similar to those

proposed in this RP/EA found that adverse project impacts would be consistent with the PDARP/PEIS findings.

Consistent with the PDARP/PEIS and past evaluations of restoration planning projects in the Gulf, projects in this RP/EA under the Habitat Projects on Federally Managed Lands, Sea Turtles, Marine Mammals, Birds, and Provide and Enhance Recreational Opportunities Restoration Types would result in minor to moderate, temporary and localized adverse impacts to ambient noise from construction. Adverse impacts to biological resources from construction-related noise are analyzed in detail for each project. Minor adverse long-term ambient noise impacts are anticipated associated with some Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities projects, where impacts may include increased visitation to particular sites. Long-term adverse impacts to ambient noise are not anticipated associated with sea turtle, marine mammal, or bird projects.

4.3.2 Socioeconomic Resources

4.3.2.1 Socioeconomics and Environmental Justice

Socioeconomics includes effects to the economy, employment, business, and industrial activities as well as population, property values, and tax revenues. Projects in this RP/EA could result in negligible to minor, short-term disruptions to regional economies during construction and implementation, as well as short-term benefits. In particular, construction activities associated with certain Habitat Projects on Federally Managed Lands (FM1, FM2, FM3), Birds (B1, B2), and Provide and Enhance Recreational Opportunities (FM5/REC6, REC1, REC 2, REC4, REC5, REC7, REC8, REC9) projects could result in temporary disruptions to routine business operations. Similarly, implementation of Sea Turtles (ST1, ST2, ST3, ST4), Marine Mammals (MM1), and other Birds (B3, B4/B5) projects may also produce minor, short-term disruptions to regional economies as a result of area restrictions and reduced recreational visitation during construction, resulting in decreases in regional business and tax revenue. These adverse impacts are expected to be short-term and localized.

Many projects in this RP/EA would benefit regional economies by increasing jobs, income, sales, and tax receipts over the short- and long-term. In the short-term, project design and construction would increase demand for employment and sales in localized areas. In the long-term, enhanced and expanded recreational opportunities (e.g., boating, fishing, diving, wildlife viewing) are expected to benefit local economies. The distribution of economic benefits within the region would depend on the locations or sourcing of labor, supplies, materials, and equipment.

The intent of an environmental justice evaluation under Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority and Low Income Populations” (1994), is to identify communities and groups that meet environmental justice criteria and suggest strategies to reduce potential adverse impacts of projects on affected groups. The purpose of Executive Order 12898 is to identify and address the disproportionate placement of adverse environmental, economic, social, or health impacts from federal actions and policies on minority and/or low-income communities. This order requires lead agencies to evaluate impacts on minority or low-income populations during

preparation of environmental and socioeconomic analyses of projects or programs that are proposed, funded, or licensed by federal agencies.

Appendix D presents general demographic data for the counties in which projects are planned. The projects in this RP/EA are anticipated to benefit natural resources or access to recreational uses of those natural resources over the long-term. As stated above, implementation of the projects, particularly those including construction activities, is anticipated to result in short-term increases in the demand for employment. While some short-term closures to localized areas could occur during project construction, none of these are anticipated in minority or low-income communities. None of the alternatives evaluated in this RP/EA would create a disproportionately high and adverse effect on minority or low-income populations (see Appendix D for details on this analysis).

4.3.2.2 Cultural Resources

Cultural resources are evidence of past human activity. These may include pioneer homes, buildings, or old roads; structures with unique architecture; prehistoric village sites; historic or prehistoric artifacts or objects; rock inscription; human burial sites; or earthworks, such as battlefield entrenchments, prehistoric canals, or mounds. These nonrenewable resources often yield unique information about past societies and environments and provide answers for modern-day social and conservation problems. Although many have been discovered and protected, numerous forgotten, undiscovered, or unprotected cultural resources exist in rural America (USDA-Natural Resource Conservation Service [NRCS] n.d.). Although neither NEPA nor any other federal law defines “cultural resource,” several laws and executive orders deal with resources that are cultural in character.

As stated in the PDARP/PEIS, all projects implemented under subsequent restoration plans and tiered NEPA analyses consistent with the PDARP/PEIS would secure all necessary state and federal permits, authorizations, consultations, or other regulatory processes, and ensure the project is in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. For some projects included in this RP/EA, the action would involve a study, analysis or program that would not have the potential to affect cultural resources. For those projects that include construction, ground disturbance, or other activities that could potentially alter the historic integrity of any culturally or historically important resources identified during project preparations or predevelopment surveys, those resource would be avoided during project implementation. A complete review of all alternatives to satisfy the requirements of Section 106 of the National Historic Preservation Act of 1966 is ongoing and would be completed prior to any activities that would restrict consideration of measures to avoid, minimize, or mitigate any adverse effects on historic properties located in the project area. Alternatives would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

Several project action areas include known or potential cultural resources. Coordination with the State Historic Preservation Office regarding the extent and nature of cultural resources at all of the locations under consideration in this RP/EA is ongoing, including with interested Tribes. Updated information with regard to compliance with Section 106 would be provided in the final RP/EA. The section below briefly highlights known sensitive cultural resources located on or near projects in this RP/EA:

- **Projects at GUIS (FM1, FM2, FM3, FM4).** Cultural and historical features are major visitor attractions to some areas where proposed restoration projects are planned, primarily at GUIS. Numerous terrestrial cultural resource surveys have been conducted in GUIS by NPS personnel and other public and private institutions. These surveys have identified archeological sites throughout GUIS that are associated with both the historic and prehistoric periods. The four national register-listed historic structures in GUIS are Fort Barrancas Historic District, Fort Pickens, Fort Massachusetts, and Perdido Key Historic District. Archeological remains are primarily midden sites with identified materials ranging from glass and ceramic to metal, and in some cases the remains of wood used in construction, fires, and tools. More information about cultural resources can be found in the "Cultural Resource Topics Considered and Analyzed in Detail" section of the GUIS Final General Management Plan/Environmental Impact Statement (GMP/EIS; NPS 2014c).
- **B2, Egmont Key Vegetation Management and Dune Retention.** Historical buildings on Egmont Key attract visitors and residents. Egmont Key was primarily used as a strategic military location starting in the mid-1800s. A number of buildings constructed for military use are still standing today, including a lighthouse, ammunition batteries, brick roads, and other buildings associated with the Fort Dade site. Egmont Key and its associated structures are national register-listed historic sites and structures. More information about cultural resources can be found in the "Cultural Resources" section of the Tampa Bay Refuges Comprehensive Conservation Plan (USFWS 2010b).
- **B3, Northeast Florida Predation Management.** Numerous sites and structures in Nassau, Duval, and St. Johns Counties in Northeast Florida are listed on the National Register of Historic Places. Historic sites such as the City of St. Augustine, Fort Matanzas, and Fort Clinch date back to mid-1700s Spanish colonies. Various prehistoric shell middens, artifacts, or other sites have also been discovered along the Northeast Florida coast. Additional information about cultural resources in these counties can be found in the Fort Matanzas National Monument Final GMP/EIS (NPS 2014b), the Fort Clinch State Park Unit Management Plan (FDEP 2017), and the Guana Tolomato Matanzas National Estuarine Research Reserve Management Plan (FDEP 2009).

4.3.2.3 Infrastructure

Infrastructure includes public services and utilities. No existing infrastructure would be adversely affected by the projects proposed in this RP/EA. Short-term adverse impacts would be none to minor. In the short-term, infrastructure may be disrupted during project construction or implementation; however, these disturbances would be temporary and minor. Ultimately, projects that are expected to have short-term, minor adverse impacts are designed to improve infrastructure, and are expected to result in long-term benefits to infrastructure. In particular, several of the Habitat Projects on Federally Managed Lands (FM3, FM4) and Provide and Enhance Recreational Opportunities projects (FM5/REC6, REC1, REC2, REC4, REC5, REC7, REC8, REC9) are expected to improve project area infrastructure.

4.3.2.4 Land and Marine Management

Project activities proposed in this RP/EA largely do not involve changes in land and marine management. With one exception (B4 and B5), project activities would not require variances or zoning changes or

amendments to land use, area comprehensive, or management plans; thus, no adverse impacts to overall use or management are expected. The Florida Shorebird and Seabird Stewardship and Habitat Management projects (B4, B5) may result in some long-term minor adverse impacts to current recreational activities related to closures and setbacks that may be established to be protective of shorebirds. FWC, as the regulatory authority for seabird and shorebird management in Florida, may establish temporary or permanent protected areas that could result in short- or long-term, minor adverse impacts to tourism and recreation depending on implemented restrictions. For example, a seasonal closure around a nesting shorebird colony would result in short-term, minor adverse impacts to tourism and recreation. Further, one project in GUIS (FM4) includes outdoor lighting upgrades but does not involve changes in Land Management, and one of the Sea Turtles projects (ST1) includes voluntary implementation of conservation measures.

4.3.2.5 Fisheries and Aquaculture

No commercial fisheries or aquaculture operations in project areas would be adversely affected by the projects proposed in this RP/EA. Short-term adverse impacts would be none to minor. In the short-term, water quality may decrease due to implementation of some projects, but these changes would be short-term and minor. The proposed Provide and Enhance Recreational Opportunities project with artificial reef enhancements (REC8), the Birds project with oyster reef enhancements (B1), and the Sea Turtles marine debris removal project (ST2) may result in long-term benefits to fish populations and to some fisheries in localized areas. In summary, no long-term adverse impacts on fisheries or aquaculture associated with these projects are expected. Recreational fisheries are analyzed as part of Tourism and Recreation.

4.3.2.6 Marine Transportation

Marine transportation, including marine vessel-traffic patterns, navigation channels, public services or utilities that support those activities, have the potential to be affected by implementation of the alternatives in this RP/EA. Some alternatives in this RP/EA include construction in marine waters along the coastline (e.g., paddlecraft docks, small fishing piers). Marine transportation activities could be affected by these alternatives; however, adverse impacts would be negligible to minor and short-term. One alternative would include use of a pipeline for dredged materials disposal in GUIS (FM2). It is possible that vessels would need to temporarily avoid areas near construction or the pipeline, resulting in negligible to minor adverse effects on marine vessel traffic from this alternative. Marine transportation is not anticipated to be affected by any of the RP/EA alternatives in the long-term.

4.4 Resources with Impacts Unique to Each Alternative

Resources identified for consideration in the PDARP/PEIS that are not addressed in Section 4.3 are addressed in the remainder of this chapter. The following resources have the potential for differing degrees of impact across the alternatives and are, therefore, analyzed separately below for each project:

- **Physical Resources** – Geology and Substrates, Hydrology and Water Quality

- **Biological Resources** – Habitats, Wildlife Species, Marine and Estuarine Fauna, Protected Species
- **Socioeconomic Resources** – Tourism and Recreational Use, Aesthetics and Visual Resources, Public Health and Safety

This section organizes the evaluation of impacts by Restoration Type, projects with similar activities, resources affected, and in one case, by watershed. Organizing the projects in this manner allows for the impacts to be evaluated at a broader scale and reduces the need for repetitive text.

4.5 Habitat Projects on Federally Managed Lands

Figure 4-1 Habitat Projects on Federally Managed Lands project locations

Habitat Projects on Federally Managed Lands

FM1, Johnson Beach Access Management and Habitat Protection
FM2, Perdido Key Sediment Placement
FM3, Old Fort Pickens Road Utility Line Relocation
FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits
FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass

The five projects under the Habitat Projects on Federally Managed Lands Restoration Type are located at GUIS and SVNWR (Figure 4-1):

- **FM1, Johnson Beach Access Management and Habitat Protection (preferred)**.
- **FM2, Perdido Key Sediment Placement (preferred)**.
- **FM3, Old Fort Pickens Road Utility Line Relocation**.
- **FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits (preferred)**.

- **FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred)**.

4.5.1 Gulf Islands National Seashore Projects

GUIS was established by the U.S. Congress on January 8, 1971 as part of the national park system. GUIS encompasses barrier islands and coastal mainland from Mississippi to the western Florida Panhandle. GUIS is comprised of 12 distinct management units stretching along 160 miles from Cat Island in Mississippi to the eastern end of Santa Rosa Island in Florida. In Florida, GUIS includes Santa Rosa Island, Perdido Key, and mainland areas in the Naval Live Oaks reservation and Pensacola Naval Air Station (NPS 2014c). The current authorized acreage of GUIS is 139,175 acres. Four of the five projects under the Habitat Projects on Federally Managed Lands Restoration Type are located in GUIS (Figure 4-1):

- **FM1, Johnson Beach Access Management and Habitat Protection (preferred)**. Location: Perdido Key Unit, Johnson Beach.
- **FM2, Perdido Key Sediment Placement (preferred)**. Location: Southeast shoreline of Perdido Key Unit.
- **FM3, Old Fort Pickens Road Utility Line Relocation**. Location: Fort Pickens Unit.
- **FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits (preferred)**. Location: East of Fort Pickens Unit in the unincorporated community of Pensacola Beach.

The GUIS GMP (NPS 2014c) provides extensive information about the coastal barrier islands in the western Panhandle and provides the basis of the information presented in the Affected Environment for the four proposed projects within GUIS unless otherwise cited.

4.5.1.1 GUIS Affected Environment

This section describes the Affected Environment for the four projects that would be implemented on GUIS and share potentially affected resources. The Florida portion of GUIS extends north to the south boundary of the Intracoastal Waterway in the area north of Santa Rosa Island and Big Lagoon. Pensacola Bay, Big Lagoon, and the area north of Santa Rosa Island are connected to the Gulf through Pensacola Pass. The portion of the area north of Santa Rosa Island, adjacent to the GUIS, is approximately 2 miles wide. Big Lagoon is a 0.75-mile-wide lagoon connected to Perdido Bay. The GUIS southern boundary extends 1 mile into the Gulf.

Physical Resources

Although barrier islands typically buffer the mainland coast from wind and waves, in Florida the dune fields along Santa Rosa Island and Perdido Key have been scoured away and nearly reduced to a rise of only a few feet above sea level. This has led to problems with even minor storms pushing Gulf waters across the barrier islands. Storms and hurricanes result in substantial damage to roads and infrastructure, as well as historic structures and existing campgrounds and utilities particularly within the Santa Rosa and Fort Pickens Units of GUIS.

GUIS has gently sloping areas associated with active and ancient sand dunes and sand hills interspersed within an otherwise level land surface. Dune and beach soils are excessively drained quartz sands and water is only available to vegetation from the surficial groundwater table. Soils at GUIS are greatly weathered and leached, with little organic material, low natural fertility, and high acidity, and beach

deposits are mostly quartz sand with varying amounts of clay, silt, and shell fragments. In marshes and interdunal swales, the soils have weathered and accumulated organic matter, resulting in wetland soils and corresponding plants. Soils in the Florida units of GUIS have low to moderate vulnerability to climate change.

The Florida section of GUIS is in the Pensacola Bay and Perdido River and Bay watersheds. The waters in GUIS have special protections and a strict dredging and filling permit review process due to their Outstanding Florida Waters designation by FDEP, and routinely undergo water quality monitoring by entities including Florida counties and NPS. Waters surrounding Perdido Key and Fort Pickens are suitable for recreational purposes and for the maintenance of well-balanced fish and wildlife populations while waters north of Santa Rosa Island are of even higher quality and suitable for shellfish harvesting. However, land use strongly influences the biology, chemistry, and ecology of GUIS and has contributed to pollutant loading in stormwater runoff, changes in groundwater recharge rates, oil and gas emissions from watercraft, atmospheric deposition of heavy metals, sewage effluent disposal, and loss of submerged aquatic vegetation (SAV) due to degraded water quality. Sensitive aquatic systems around GUIS that may be affected by water quality include SAV and associated fauna, marshes, and nektonic communities (e.g., fish, reptiles, marine mammals). The waters in Pensacola Bay and Santa Rosa Sound are impaired due to bacteria (FDEP 2020d).

Further information about geology and substrates can be found in the Soils section in Chapter 3 of the GUIS GMP (NPS 2014c), and further information about hydrology and water quality can be found in the Water Quality section in Chapter 3 of the GUIS GMP (NPS 2014c).

Biological Resources

Habitats along GUIS include freshwater and salt marshes, lagoons, bayhead swamps, beaches, dunes, coastal grasslands, longleaf pine savannas and wet pine flatwoods, maritime and southern mixed hardwood forests, and interdunal swales. The vegetation that grows in this environment plays a critical role in the formation, growth, shape and eventually stabilization if conditions allow within the dune environment. The instability, poor soil nutrients, and almost nonexistent soil moisture make plant establishment very difficult in this environment. Primary dunes are dynamic because of the constant movement of sand causing dunes to build, blowout, and migrate. Primary dunes also bear the brunt of storms that often remove great volumes of sand from the dunes. Other sources of habitat damage and loss in the GUIS include development and roads, pedestrian and vehicle traffic, trash accumulation, loose pets, and nonnative and invasive species. There are several areas in the GUIS that may be seasonally closed due to potential negative impacts of visitors on nesting of federal and state-listed shorebirds. Pedestrians, bicyclists, and vehicles can also cause mortality to birds and turtles. Parking is an issue in GUIS due to vehicles parked on sensitive vegetation outside of designated parking areas.

The health and coverage of SAV beds have been declining across the Gulf for the past 60 years. All SAV beds within the GUIS marine environment have extensively declined or in some cases disappeared due to increased turbidity caused by harbor and Intracoastal Waterway dredge-and-fill activities, boat traffic, shoreline modification, adjacent development leading to reduced water quality, and natural events such as tropical storms, hurricanes, and changes in salinity. SAV beds in GUIS waters provide important habitat for wildlife, including vital nursery areas for Gulf fisheries. Dominant SAV species found in GUIS waters include shoal grass (*Halodule wrightii*), turtle grass (*Thalassia testudinum*), and manatee grass

(*Cymodocea filiformis*). Other brackish water species include widgeongrass (*Ruppia maritima*), star grass (*Halophila engelmannii*), and tape grass (*Vallisneria americana*).

The diverse habitats in GUIS also support numerous nonnative terrestrial and aquatic vegetation species. A total of 24 nonnative plant species have been found in GUIS with new species introduced each year. Invasive species removal in GUIS is led by NPS staff under SOPs. Mechanical removal is considered the primary method, while chemical control is a secondary method provided that certain requirements are met. GUIS actively collaborates with NPS invasive plant management teams, local municipalities, the State of Florida, and researchers from Florida and Mississippi to determine the best approaches to managing each nonnative species. Invasive plants of particular concern at GUIS include torpedo grass (*Panicum repens*), cogon grass (*Imperata cylindrica*), lantana (*Latana spp.*), Chinese tallow (*Sapium sebiferum*), and Japanese privet hedges (*Ligustrum japonicum*). New occurrences such as kudzu (*Pueraria montana*), Japanese climbing fern (*Lygodium japonicum*), rattle box (*Sesbania punicea*), and water hyacinth (*Eichhornia crassipes*) are actively managed to control the size of emerging infestations. Chinaberry (*Melia azedarach*) and mimosa (*Albizia julibrissin*) are almost eradicated from GUIS. Repeated disturbance from recent hurricanes has exacerbated the persistence of many invasive plants, especially torpedo grass, cogon grass, and Chinese tallow. Construction activity in and near GUIS is also a source of new infestations, as improperly sanitized vehicles and equipment can transport invasive plant seeds. Vehicles, boats, and visitor activities are also sources of new infestations. Additional information about habitats in Florida sections of GUIS can be found in the Wetlands and Terrestrial Vegetation and Wildlife sections in Chapter 3 of the GUIS GMP (NPS 2014c).

More than 200 species of fish occur within the waters of GUIS including several commercially and recreationally important species. Speckled sea trout spawn around the islands and are often the most sought-after sport fish. Waters surrounding GUIS provide essential fish habitat (EFH) for shrimp, reef fish (e.g., snapper, groupers, tilefishes, and amberjacks), red drum (*Sciaenops ocellatus*), and coastal migratory pelagics (Spanish mackerel [*Scomberomorus maculatus*], cobia [*Rachycentron canadum*], king mackerel [*Scomberomorus cavalla*]) (NOAA 2018).

Common smaller native mammal species found in GUIS include marsh rabbit (*Sylvilagus palustris*), eastern cottontail rabbit (*Sylvilagus floridanus*), opossum (*Didelphis virginiana*), squirrels, skunks, gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), eastern woodrat (*Neotoma floridana*), hispid cotton rats (*Sigmodon hispidus*), eastern mole (*Scalopus aquaticus*), southeastern pocket gopher (*Geomys pinetis*), short-tailed shrews, and a variety of bats. River otters (*Lontra canadensis*) can also be found in the canals near Fort Pickens in Florida.

GUIS has more than 280 species of birds that use the islands for loafing, nesting, feeding, wintering, or migratory rest stops. These birds include songbirds, waterfowl, wading birds, birds of prey, seabirds, and shorebirds. Sandpipers, herons, egrets, ospreys (*Pandion haliaetus*), marsh wrens (*Cistothorus palustris*), terns, gulls, and several species of rails are just a few species that use the island habitats. Shorebird nesting, foraging, and loafing areas occur along both north and south shorelines of GUIS and the Naval Live Oaks Area in Florida. Shorebird colonies along Fort Pickens Road and J. Earle Bowden Way are managed through law enforcement, signs, and closures because the roads bisect breeding bird habitat due to adverse impacts to colonies of black skimmers (R*ynchops niger*), piping plover (*Charadrius melodus*), least tern (*Sternula antillarum*), and other shorebirds. Great blue heron (*Ardea herodias*) and

night heron nest and roost on Perdido Key and Santa Rosa Island. Ospreys nest on Santa Rosa Island and in the Naval Live Oaks Area.

Several of the federally listed threatened and endangered species found in GUIS are not documented as occurring in the four project areas due to absence of appropriate habitat, including the Alabama red-bellied turtle (*Pseudemys alabamensis*), dusky gopher frog (*Lithobates sevosus*), and Mississippi sandhill crane (*Grus canadensis pulla*). The current federal species list, as identified through USFWS Information for Planning and Consultation (IPaC), is summarized in Appendix E (USFWS 2018).

Non-native wildlife species found in GUIS include Norway rat (*Rattus norvegicus*), armadillo (*Dasypus novemcinctus*), coyotes (*Canis latrans*), wild hogs (*Sus scrofa*), red fox (*Vulpes vulpes*), and black rat (*Rattus rattus*) as well as aquatic organisms such as various jellyfish, clams, crabs, fish, snails, bacteria, and viruses. These are potentially invasive or harmful and are therefore managed if necessary.

Additional information about wildlife, vegetation, and invasive species in the GUIS can be found in Chapter 3 of the GUIS GMP (NPS 2014c).

Socioeconomic Resources

GUIS is the most heavily visited seashore and one of the most visited park units in the national park system. The Florida sections of GUIS receive approximately 75 percent of the total visitors to GUIS. Most visitors come from within a 500-mile radius, including the states of Georgia, Alabama, Florida, Mississippi, Tennessee, Louisiana, Texas, and Arkansas. Changes in annual visitation to GUIS are influenced by hurricanes and other strong coastal storms. Hurricanes can close bridges and destroy piers, beaches, and visitor facilities. Historical features play a highly visible and important role in the overall visitor enjoyment and national significance of GUIS. The forts of GUIS span more than 200 years of history, from the Spanish colonial Bateria de San Antonio (1797) to the World War II-era Battery 234.

Three counties are adjacent to GUIS—Escambia, Santa Rosa, and Okaloosa Counties. In Florida, the largest industry sector is the services sector, which employs 73,340 persons, followed by retail trade (41,850 persons), military and Department of Defense civilians (23,446 persons), state and local government (21,710 persons), and construction (16,110 persons). A study by Livingston and Arthur (2002) found that tourism is a strong component of growth of retail and service-based businesses within the Pensacola region and that tourist visitation is directly correlated with the quality and amount of seashore beaches. The Pensacola economy also remains dependent on military and defense-industry spending.

Currently, GUIS is used for recreational activities such as camping, hiking, fishing, biking, swimming, boating, and bird watching. More information about tourism and recreation can be found in the "Visitor Use and Experience Topics Analyzed in Detail" and "Social and Economic Environment Topics Analyzed in Detail" sections of Chapter 3 in the GUIS GMP (NPS 2014c).

4.5.1.2 FM1, Johnson Beach Access Management and Habitat Protection (Preferred)

This project would enhance sensitive beach and dune habitat by managing visitor access within the Perdido Key Unit of GUIS. Current uncontrolled foot traffic has negatively impacted beach and dune habitat and disturbs beach-nesting birds, and poorly constructed dune crossovers create habitat fragmentation for protected species including the Perdido Key beach mouse (*Peromyscus polionotus*

trissyllepsis). Activities relevant to the assessment of the environmental consequences for this project include:

- Constructing three paved parking lots;
- Installing post-and-rope fencing;
- Removing 11 existing dune crossovers;
- Constructing eight new, raised crossovers, including one new ADA-compliant crossover;
- Converting the last 0.5 miles of existing road to a 12-foot wide, unpaved bicycle-pedestrian-only path;
- Implementing predator-deterrent measures such as a predator-proof trash receptacles; and,
- Implementing human-disturbance-deterrent measures such as temporary closure of sensitive areas (including pre-season posted areas), symbolic fencing, road crosswalks that function as speed humps, handrails on dune crossovers, and visitor education measures.

Resources Analyzed in Detail for this Alternative

Table 4-1 identifies how potentially affected resources are analyzed for this alternative.

Table 4-1 NEPA Assessment of Resources for FM1

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.5.1.2
Hydrology and Water Quality [a]	Does not require additional analysis. Project activities would not include any in-water work or disruptions to hydrology or water quality on the islands.
Biological Resources	
Habitats	Analyzed in Section 4.5.1.2
Wildlife Species (including birds)	Analyzed in Section 4.5.1.2
Marine and Estuarine Fauna (fish, shellfish, benthic organisms) [a]	Does not require additional analysis. Project activities would not include any in-water work or disruptions to marine and estuarine fauna.
Protected Species	Analyzed in Section 4.5.1.2
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.5.1.2
Aesthetics and Visual Resources	Analyzed in Section 4.5.1.2
Public Health and Safety	Analyzed in Section 4.5.1.2
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

Environmental Consequences

A NEPA analysis for this project was completed through the 2016 NPS Environmental Assessment to Improve Barrier Island Habitat and Visitor Access at Perdido Key/Johnson Beach Area and is incorporated by reference herein (hereafter referred to in this section as the NPS EA; NPS 2016b). The NPS issued a finding of no significant impact (FONSI) as a result of the EA (NPS 2018).

Physical Resources

This alternative would involve terrestrial-based construction of three new parking lots, demolition of 11 existing dune crossovers, construction of eight new dune crossovers, and removal of asphalt along the easternmost 0.5 miles of road. Implementation could include use of heavy construction equipment, such as bulldozers, trucks, backhoes, tractor trailers, cranes, small excavators, forklifts, asphalt machines, rollers, small power tools, generators, small trucks, and hand tools. Construction vehicles and staging equipment would utilize previously existing roads, parking areas, or other disturbed areas.

As discussed in the NPS EA, construction activities are expected to result in short-term adverse impacts to geology and substrates in the sites where ground disruption would occur. Ground-disrupting activities and vegetation removal for the new parking areas, removal of 0.5 miles of roadbed, and removal and construction of dune crossovers may result in increased erosion. Erosion mitigation measures such as silt fences would be implemented during construction. A total of approximately 58,915 square feet (1.35 acres) of habitat are expected to be negatively impacted by the new parking lots (NPS 2016b).

Post-construction, this alternative is likely to result in long-term benefits to dune habitats (NPS 2016a). Constructing designated parking lots and dune crossovers and removing asphalt and motor vehicles from the easternmost 0.5 miles of road would reduce erosion caused by foot trails and vehicular disturbance. Managing visitor access to certain points along Johnson Beach Road would concentrate use rather than having dispersed disturbance along the entire road. Long-term reduced disturbance is expected to have benefits to substrates at Perdido Key, leading to dune stabilization and increasing the capacity to buffer storms. This alternative is anticipated to improve 154.9 acres of beach-dune habitat, including reclaiming approximately 4.9 acres of dunes (NPS 2016b).

In summary, this project is anticipated to result in short-term minor adverse impacts and long-term benefits to geology and substrates.

Biological Resources

Terrestrial-based construction would disturb habitat and wildlife resources in the short-term during active ground-disrupting activities. As described in the NPS EA, the construction of three parking lots and eight dune crossovers as well as the removal of asphalt and 11 existing dune crossovers could result in short-term minor adverse impacts to habitats, vegetation, and wildlife, including protected species. These activities could result in removal of vegetation and habitat disruption at the parking lot and dune crossover locations. A total of approximately 58,915 square feet, or 1.35 acres, of vegetated dune habitat and associated wildlife and protected species may experience short-term adverse impacts (NPS 2016b). Conservation measures (e.g., surveys to identify presence and seasonal avoidance) would be implemented to reduce disturbance on protected species including beach-nesting and foraging birds and sea turtles, and the Perdido Key beach mouse (as outlined in its recovery plan) (NPS 2016b).

This project would also have long-term benefits to biological resources. The project would restore dunes and beaches that provide important coastal habitat for beach-nesting birds, beach mice, and sea turtles, allowing it to recover its natural vegetation and processes with as little disturbance as possible. Long-term benefits to dune vegetation and protected species would result from the reduced dispersed visitor use in the Johnson Beach area (NPS 2016b). Specifically, removing asphalt and motor vehicles from the easternmost 0.5 miles of road and directing visitor use to designated parking lots and dune crossovers rather than dispersed foot trails would result in natural recovery of dune plants and reduce disturbance

to wildlife and protected species (including the Perdido Key beach mouse). The new crossovers would have handrails to limit foot traffic to the crossovers and would be raised enough to allow wildlife to pass under them, thus increasing habitat functionality in these areas. Additionally, enhanced beach-nesting bird monitoring, enforcement of speed restrictions and habitat closure areas, and implementation of conservation measures such as predator-proof receptacles would reduce human- and predator-related disturbances on beach and dune habitat and associated living resources. This alternative is anticipated to improve 154.9 acres of beach-dune habitat, including reclaiming approximately 4.9 acres of dunes, that would benefit protected resources (NPS 2016b).

Pursuant to the ESA, the NPS prepared a biological assessment and made a preliminary determination that the proposed alternative may affect but is not likely to adversely affect piping plover, red knot (*Calidris canutus*), and nesting sea turtles and is likely to adversely affect Perdido Key beach mouse and its critical habitat (NPS 2016a). NPS began consultation with USFWS on April 6, 2016, resulting in the USFWS issuing a BO in March 2017. In the BO, USFWS concurred with NPS that the proposed alternative may affect but is not likely to adversely affect loggerhead (*Caretta caretta*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), and Kemp's ridley (*Lepidochelys kempii*) sea turtles, piping plovers, and red knot or adversely modify their critical habitat based on the inclusion of conservation measures (USFWS 2017). Additionally, USFWS determined that the proposed alternative would not jeopardize the continued existence of the Perdido Key beach mouse and would not adversely modify their critical habitat based on the inclusion of conservation measures, terms and conditions, and PDC (USFWS 2017). See Table 4-24 for this project's environmental compliance status. Based on these determinations, this project would have minor to moderate short-term adverse impacts to protected species.

In summary, this project is anticipated to result in short-term minor to moderate adverse impacts and long-term benefits to biological resources.

Socioeconomic Resources

Section 3.6.4 of the NPS EA describes impacts to socioeconomic resources from the proposed alternative. Construction and implementation may result in temporary closures or traffic delays in the park, resulting in short-term, minor-to-moderate adverse impacts on visitors and visitor experiences, including aesthetics and visual resources. However, the project would be constructed during the off-season to the greatest extent possible to mitigate adverse impacts to visitors (NPS 2016b). Additional short-term, minor adverse impacts would result from the new parking configurations and slight decrease in the total amount of parking as visitors become accustomed to the new features. This project would have long-term, minor adverse impacts on RV drivers, who would be restricted from driving beyond the main parking lot, and motor vehicles, who would be restricted from driving along the easternmost 0.5 miles of Johnson Beach Road.

Improving visitor management would result in long-term benefits to visitors at the Perdido Key Unit of GUIS. Pedestrians and cyclists would benefit from the road conversion to a bicycle-pedestrian-only path along the easternmost 0.5 miles of Johnson Beach Road. NPS would benefit from having improved management of their parking facilities. Removing roadside parking and creating dedicated parking lots would benefit public safety and visitor experience by removing a known source of visitor conflict and reducing traffic jams. Finally, the new dune crossovers would improve visitor access to beach and dune habitat, as well as improve scenic resources by restoring degraded dune habitat.

In summary, this project would benefit socioeconomic resources (NPS 2016b).

4.5.1.3 FM2, Perdido Key Sediment Placement (Preferred)

This project would partially supplement the natural sediment budget for the Perdido Key Unit of GUIS through the placement of dredged material in swash zones and on beaches. The goal of the project is to: 1) improve habitat at Perdido Key that is home to a wide variety of wildlife, including the Perdido Key beach mouse, nesting sea turtles, a variety of shorebirds, and a wide variety of plants, and 2) increase the ability of Perdido Key to withstand the natural erosive effects of storms. Activities relevant to the assessment of the environmental consequences for this project include:

- Dredging activities to obtain appropriate sediments (dredge site to be determined at a later date)[57]; and,
- Re-introducing sand into the barrier-island system, using a pipeline from the dredging operation, through:
    - "Swash-zone" placement (the area extending from 3-foot above MHW to MLW); or,
    - Direct "on-beach" placement (the area extending from 8-foot above MHW to MHW). The exact placement location would depend on the condition of the shoreline at the time of the next dredging cycle at Pensacola Pass.

Resources Analyzed in Detail for this Alternative

Table 4-2 identifies how potentially affected resources are analyzed for this alternative.

Table 4-2 NEPA Assessment of Resources for FM2

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.5.1.3
Hydrology and Water Quality	Analyzed in Section 4.5.1.3
Biological Resources	
Habitats	Analyzed in Section 4.5.1.3
Wildlife Species (including birds)	Analyzed in Section 4.5.1.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.5.1.3
Protected Species	Analyzed in Section 4.5.1.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.5.1.3
Aesthetics and Visual Resources	Analyzed in Section 4.5.1.3
Public Health and Safety	Analyzed in Section 4.5.1.3
Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

Environmental Consequences

The USACE Lower Pensacola Harbor Federal Navigation Channel Environmental Assessment and Finding of No Significant Impact (USACE 2010 EA/FONSI) provides NEPA analysis for sediment dredging and

[57] If project activities are coordinated with USACE or Navy O&M dredging in Pensacola Pass and Bay, then dredging activities would not occur with NRDA funds, resulting in cost savings for the FL TIG.

swash-zone placement of dredged materials. The USACE 2010 EA/FONSI is primarily referenced in the Environmental Consequences section unless otherwise cited.

Physical Resources

The placement of dredge materials along the shore or beach of Perdido Key would alter the geology in the swash zone and beach areas and cover existing substrates with new dredged substrate. The proposed dredging and sand-placement activities would also result in short-term minor adverse impacts to water quality (USACE 2010). Siltation and turbidity are expected to be low and not pose a significant problem to water quality since the dredged material would be predominantly sandy with minimal fine-grained silts or clays (i.e., beach-quality sand; USACE 2010). The sandy material being dredged and placed on the designated beach and nearshore areas is littoral sand from the same source as the sand found within these proposed disposal sites. The USACE determined the sediment from the Pensacola Pass dredge location is compatible with the disposal location. Previous operations and water quality certifications have found that the material dredged from the site is free of contaminants (USACE 2010). Sand sources other than Pensacola Pass (such as U.S. Navy dredge sites) may be utilized if materials meet compatibility standards (based on grain size composite analyses and color).

The proposed project would also result in benefits to physical resources. Coastal ecological resources along the local beach systems have consistently been diminished due to the high shoreline recession rates exhibited in this region, most attributed to hurricanes and tropical storms. The result has been the loss of valuable habitat including sea turtle nesting habitat, shorebird foraging and roosting areas, dune habitat supporting various flora and fauna, and general beach ecosystem functions. Placing quality material in the local Perdido Key littoral system would allow greater stability and sustainability of the coastal environment once it becomes reestablished, providing long-term benefits to geology and substrates (USACE 2010).

In summary, this project is anticipated to result in short-term minor adverse impacts to physical resources as well as long-term benefits.

Biological Resources

The benthic habitats within the dredge channel and swash-zone placement site and terrestrial habitats within the on-beach placement site would be lost during implementation activities. Turbidity levels would increase during the dredging and placement operations. BMPs would be used to minimize adverse turbidity impacts to adjacent biological resources during placement operations. BMPs that may be used include ensuring borrow material is compatible with the native beach sand and monitoring turbidity levels during placement activities (USACE 2010). It is anticipated that the levels of turbidity would subside shortly after dredging operations is complete. Due to the nature of the existing shallow water bottoms (i.e., sandy bottom with no SAV or wetlands) and on-beach placement site (i.e., sandy beach with no vegetation) there should be no basic change in overall productivity. Project activities would have moderate adverse impacts on biological resources.

There would be temporary disruption of marine species caused by dredging and placement activities. Dredged material would be delivered to the placement site via a pipeline that is submerged, floating, or a combination depending on factors such as weather, distance, and type of pipeline used. Floating pipelines can be perceived as a barrier to marine mammal (specifically bottlenose dolphin) movement; as such, if recommended during environmental compliance review and if a floating pipeline is used,

BMPs such as avoiding traversing waterbodies would be implemented. Non-motile benthic fauna within the area would be destroyed by dredging and placement operations but should repopulate within 12 months upon project completion. Motile benthic and pelagic fauna, such as crabs, shrimp, and fishes can avoid the disturbed area and should return shortly after the activity is completed. Larval and juvenile stages of these forms may not be able to avoid the activity due to limited mobility. Losses to the benthic and pelagic fauna should not be significant due to the small area (percentage wise) of ecosystem that would be affected at any given time (USACE 2010).

The most vulnerable organisms during this action would be benthic animals, such as polychaete worms, shrimp, and crabs. Placement of dredged material could temporarily disrupt benthic communities occupying these areas. Adjacent benthic communities are anticipated to move into the dredged and placement site and begin re-colonization. Temporary reduction of light penetration may affect primary production by phytoplankton zooplankton populations. However, due to the nature of the materials to be utilized these adverse impacts to marine fauna would be short-term and moderate in nature.

Heavy machinery would be used to transport personnel and equipment to the placement site, pull pipelines along the beach, and move deposited sediment. Sediment placement would take 30-60 days and be operational 24 hours per day, 7 days per week, using floodlights to work at night. Terrestrial wildlife (including migratory birds) may be present during implementation and disturbed by construction activities. To mitigate adverse impacts to terrestrial species, BMPs such as traversing the beach near the waterline and construction outside shorebird nesting season would be implemented. These short-term, moderate adverse impacts to terrestrial wildlife would return to baseline once construction is complete.

The 2010 USACE EA/FONSI made an initial determination that project activities would not adversely impact or threaten the continued existence of any threatened or endangered species potentially occurring in the project area (USACE 2010). This is conditional that efforts would be made to conduct the placement of the beach quality sand during the most desirable environmental windows (e.g., outside of sea turtle and shorebird nesting season) to the maximum extent practicable (USACE 2010). The USACE has completed ESA consultations regarding dredging and swash-zone placement activities. NMFS determined that, with the implementation of appropriate conservation measures, hopper dredging was likely to adversely affect but not likely to jeopardize the continued existence of ESA-listed species under NMFS purview (specifically sea turtles and Gulf sturgeon [*Acipenser oxyrhynchus desotoi*]) and would not destroy or adversely modify designated Gulf sturgeon critical habitat (NMFS 2003). USFWS determined that, with the implementation of appropriate conservation measures such as monitoring for sand compaction and escarpments, the project may affect but is not likely to adversely affect the West Indian manatee (*Trichechus manatus*) and piping plover and is likely to adversely affect but not likely to jeopardize the existence of nesting sea turtles or the Perdido Key beach mouse or destroy or adversely modify designated critical habitat for the Perdido Key beach mouse (USFWS 2010a). Based on these determinations, this project would have short-term moderate adverse impacts on protected species. The FL TIG has completed technical assistance with relevant regulatory agencies on this project regarding potential adverse impacts, specifically for on-beach sand placement, to protected species and habitats. See Table 4-24 for this project's environmental compliance status.

This project would also result in benefits to biological resources. Biological resources are expected to recover rapidly, and the affected areas should repopulate with benthic invertebrates once project

activities are complete. The project would not only maintain existing habitat for the local benthos and coastal fauna, but also increase it (USACE 2010).

In summary, this project is anticipated to result in short-term moderate adverse impacts to biological resources and long-term benefits to coastal habitat and fauna.

Socioeconomic Resources

For a short time, the construction process would limit recreational activities near the dredge pipe and equipment staging areas. These short-term closures would result in minor adverse effects to visitors. Additionally, if a floating pipeline is used to transport dredged material, it may detract from the area's aesthetic quality. However, once completed, the deposition of sediments both on-beach and in the swash zone would maintain more aesthetically pleasing beaches and vegetated dunes which would supply more area for active and passive recreational activities, resulting in a medium- to long-term benefit to recreators (USACE 2010).

In summary, this project is anticipated to result in short-term minor adverse effects to visitors and long-term benefits to recreators.

4.5.1.4 FM3, Old Fort Pickens Road Utility Line Relocation

This project would relocate utility lines currently located in sensitive beach and dune habitat at the Fort Pickens Unit of GUIS. In 2017, 1.4 miles of Fort Pickens Road was re-aligned to the north to avoid the storm surges and flooding that were occurring more regularly and putting the road and visitors at risk; however, a power cable and force main sewer line were left at the original road site. This project would relocate the remaining utility lines to reduce risk to visitors and wildlife from continued erosion. Activities relevant to the assessment of the environmental consequences for this project include:

- Removing the utility infrastructure – a #5-size power cable, a 4-inch force main sewer line, and two valve cluster boxes – from the former roadbed (1.4 miles) of the recently aligned Fort Pickens Road; and,
- Reburying the utility lines along the new section of road to the north.

Resources Analyzed in Detail for this Alternative

Table 4-3 identifies how potentially affected resources are analyzed for this alternative.

Table 4-3 NEPA Assessment of Resources for FM3

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.5.1.4
Hydrology and Water Quality [a]	Does not require additional analysis. Project activities would not include any in-water work and would have no effect on hydrology or water quality.
Biological Resources	
Habitats	Analyzed in Section 4.5.1.4
Wildlife Species (including birds)	Analyzed in Section 4.5.1.4
Marine and Estuarine Fauna (fish, shellfish, benthic organisms) [a]	Does not require additional analysis. Project activities would not include any in-water work and would have no effect on marine or estuarine fauna.
Protected Species	Analyzed in Section 4.5.1.4
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.5.1.4
Aesthetics and Visual Resources	Analyzed in Section 4.5.1.4
Public Health and Safety	Analyzed in Section 4.5.1.4
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

Environmental Consequences

The Environmental Assessment for the Fort Pickens Road Realignment and FONSI (hereafter referred to as Fort Pickens EA; NPS 2014a) analyzes the environmental consequences of the previous road realignment that created a need for this proposed alternative. Since the Fort Pickens EA occurs in the same location and involves similar construction activities as this proposed alternative, it is incorporated by reference herein.

Physical Resources

This project would dig up and remove 1.4 miles of utility lines along the old Fort Pickens Road roadbed and relocate and bury the lines to the new, northern road site. Implementation could include use of heavy construction equipment, such as bulldozers, trucks, backhoes, tractor trailers, cranes, small excavators, forklifts, small power tools, generators, small trucks, and hand tools. Where possible, construction vehicles and staging equipment would utilize previously existing roads, parking areas, or other disturbed areas.

Project activities would have short-term, minor localized adverse impacts to geology and substrates. The use of construction equipment and digging activities could cause localized erosion during implementation. As described in the Fort Pickens Road EA, this project could implement erosion-control measures such as silt and sediment screens to reduce erosion during construction (NPS 2014a). Additionally, the NPS has identified a sand-borrow location that could be used to renourish parts of the beach or dunes that experience higher levels of erosion (NPS 2014a).

Relocating the utility lines at present would avoid potential construction-related adverse impacts on future dune geology and substrates. Without the removal, beach and dune habitats would begin to recover at the old road site and sand would potentially accumulate over the utility lines. As such, any future construction to remove the utility lines would have great adverse impacts on dune habitats. Additionally, if the utility lines are moved at present, naturally recovering beach and dune geology and substrates would not need to be disturbed in the event that the utility lines need maintenance in the future.

In summary, this project is anticipated to result in short-term, minor localized adverse impacts to beach and dune geology and substrates and long-term benefits to localized geology and substrates by reducing the impact of moving the lines at a future date after beach and dune habitat naturally recovers over the old roadbed.

Biological Resources

Digging up, moving, and reburying the utility lines along the new road would negatively impact the previously disturbed habitat at the current utility line site and the proposed new site (along the new road). As described in the Fort Pickens Road EA, this project could employ erosion-control measures such as silt and sediment screens to reduce erosion of this sensitive habitat and sedimentation on nearby dune vegetation (NPS 2014a). Some plants may be dug up as part of construction, depending on how much beach and dune habitat has recovered in the old roadbed. This project would have short-term, moderate adverse impacts on habitats.

The new road site is adjacent to various wetland habitats (NPS 2014a). This project would site the utility line reburial along the southern edge of the new road to avoid negatively impacting wetland habitats.

Terrestrial wildlife and protected species may experience short-term, minor-to-moderate adverse localized impacts due to construction activities, disturbance of dune habitat, and human presence and construction-related noise. Construction and associated noise and disturbance is likely to cause short-term adverse impacts on feeding, foraging, and nesting of shorebirds as well as nesting sea turtles. These activities could also disturb the Santa Rosa beach mouse (*Peromyscus polionotus leucocephalus*), although disturbances are likely to be minor since this species is only active at night. Adverse impacts on shorebirds and nesting sea turtles would be minimized by restricting construction to months outside shorebird and sea turtle nesting seasons.

This project would implement standard construction conservation measures described in the PDARP/PEIS and the Fort Pickens Road EA to reduce adverse construction-related impacts to wildlife and protected species. These measures include temporal and seasonal closures (i.e., constructing outside of sea turtle and shorebird nesting season), monitoring for protected species within the construction zone, and using silt or sediment screens to reduce adverse impacts to adjacent vegetated dune habitat (NPS 2014a). The FL TIG would coordinate and complete consultation with relevant regulatory agencies, if necessary, on this project regarding potential adverse impacts to protected species and habitats prior to project implementation.

This project would also result to benefits to biological resources. Once the lines are reburied along the new road site, the beach and dune habitats at the original site would be able to recover without future threat of disturbance from utility maintenance. Delaying the utility line relocation may result in more severe adverse impacts to future beach and dune habitats as these habitats become more established

and vegetation returns to the old roadbed. This project would also reduce the risk to wildlife of having the utility lines located in highly erosive beach habitat. The current utility line location is subject to storm-surge and wave-based erosion, increasing the risk of utility-line damage that could in turn further injure beach and dune habitat and wildlife therein; moving the utility lines upland reduces this long-term risk. Additionally, as beach and dune habitats recover over the old road site and wildlife move into this new habitat, accessing the utility lines at the current site in the future for maintenance or relocation would potentially cause a greater adverse impact to these biological resources compared to moving the lines at present.

In summary, this project is anticipated to result in short-term, moderate localized adverse impacts to biological resources from construction-related activities and long-term benefits.

Socioeconomic Resources

Visitation to the project site would likely be negatively impacted during construction activities. Portions of the beach along the old Fort Pickens Road site would be temporarily closed to visitors during utility-line removal, and construction equipment along the beach would temporarily negatively impact recreational activities in the project area. However, visitors would continue to be able to use Fort Pickens Road and other portions of the beach would be open to recreation during construction. Construction activities would occur outside of the primary tourism season to the extent possible. Long-term adverse impacts to visitation are not anticipated.

DOI, as the Implementing Trustee, would coordinate with utility companies who are trained to implement utility-line relocations with minimal adverse impacts to surrounding communities. Short-term economic benefits associated with employment and expenditures associated with construction activities would occur, particularly to the extent that local utility companies are utilized (NPS 2016a). Over the long-term, the relocation of utility lines away from erosive wave energy would provide long-term benefits to public health and safety by reducing the risk of the utility lines being damaged from erosion, which should reduce future power disruptions.

In summary, this project is anticipated to result in negligible to short-term, minor adverse impacts on visual resources and recreational access, short-term benefits associated with construction activities, and minor long-term benefits associated with public health and safety improvements.

4.5.1.5 FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits (Preferred)

This project would reduce the adverse impact of artificial lighting on federally managed beach and dune habitat at GUIS by installing lighting retrofits along a portion of adjacent Fort Pickens Road in the unincorporated community of Pensacola Beach. Activities relevant to the assessment of the environmental consequences for this project include:

- Removing approximately 170 dual-headed, low-pressure sodium fixtures on Fort Pickens Road west of Casino Beach to the GUIS boundary; and,
- Installing 170+ new FWC-certified wildlife-friendly amber LED fixtures on existing poles and power infrastructure (existing power infrastructure and poles would remain in place).

Resources Analyzed in Detail for this Alternative

Table 4-4 identifies how potentially affected resources are analyzed for this alternative.

Table 4-4 NEPA Assessment of Resources for FM4

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates[a]	Does not require additional analysis. Project activities would not impact geology or substrates.
Hydrology and Water Quality[a]	Does not require additional analysis. Project activities would not impact hydrology or water quality.
Biological Resources	
Habitats	Analyzed in Section 4.5.1.5
Wildlife Species (including birds)	Analyzed in Section 4.5.1.5
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.5.1.5
Protected Species	Analyzed in Section 4.5.1.5
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.5.1.5
Aesthetics and Visual Resources	Analyzed in Section 4.5.1.5
Public Health and Safety[a]	Does not require additional analysis. Project activities would not impact public health and safety.
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

Environmental Consequences

The DWH Oil Spill Phase II Early Restoration Plan and Environmental Review (hereafter referred to as the Phase II plan) analyzed a similar lighting retrofit project along the Florida Panhandle. This analysis is summarized and incorporated by reference below.

Physical Resources

As noted in Table 4-4, all physical resources are either addressed in Section 4.3 or do not require additional analysis.

Biological Resources

The Phase II plan categorically excluded this project from further NEPA evaluation because it was anticipated to only result in negligible adverse impacts to biological resources and fell within the DOI categorical exclusions (CEs) 516 Department Manual (DM) 8.5A(2), 516 DM 8.5B(2), and 516 DM 8.5(11) (DWH Trustees 2012). Project activities would occur within the highly developed Fort Pickens Road corridor and would include the replacement of light fixtures on existing poles (i.e., would not require construction). The FL TIG has completed technical assistance with relevant regulatory agencies regarding potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status.

Project activities would have beneficial effects on biological resources including habitats, wildlife, protected species, and marine and estuarine fauna. Nighttime light pollution and sky glow can alter daily and seasonal light cycles which negatively impact all marine and coastal species. Specifically, light

pollution can negatively impact light cycles which drive fish migrations, marine invertebrate larvae dispersal and settlement, and nearshore species' feeding and predator-prey relationships. The Phase II plan recognized that artificial lights that illuminate beaches result in reduced sea turtle nesting activity on beaches and disorientation of hatchlings (DWH Trustees 2012). The Restoring the Night Sky Project described in the Phase II plan intended to enhance habitat for loggerhead sea turtles by reducing the amount of light cast onto beaches in the Florida Panhandle and Gulf State Park (DWH Trustees 2012). These actions were also expected to benefit other native species including migratory birds, beach-nesting birds and sea turtles, beach mice, bats, amphibians and other reptiles.

In summary, consistent with the Phase II plan, this project is anticipated to result in negligible adverse impacts to the biological resources and would result in long-term benefits to biological resources.

Socioeconomic Resources

Because there is little ground disturbance or construction anticipated as part of this project, it is expected to have none to negligible effects on most aspects of socioeconomic resources. This project is anticipated to largely benefit aesthetics and visual resources because night-time lighting would be softer and less glaring. Improvements in lighting hardware and lighting schedules should also reduce maintenance and electricity costs.

In summary, this project is anticipated to result in none to negligible adverse impacts on socioeconomic resources, and long-term benefits such as softer lighting and reduced electricity costs.

4.5.2 FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (Preferred)

The primary goals of this project are to (1) acquire and enhance a 10-15-acre parcel at Indian Pass to ensure boat access to SVNWR in perpetuity and (2) enhance recreational opportunities at the parcel. Project activities most relevant to assessment of the environmental consequences include:

- Acquiring a 10-15-acre parcel at Indian Pass for inclusion in SVNWR;
- Increasing vehicle/trailer unpaved parking at the existing boat ramp from approximately 14 to 31 spaces;
- Installing monofilament fishing line recycling bins;
- Converting the campground store to a visitor contact station including interior and exterior remodeling; and,
- Constructing a gravel space for kayak boat launches (no launch structure) with 10 unpaved parking spaces.

4.5.2.1 Resources Analyzed in Detail for this Alternative

Table 4-5 identifies how potentially affected resources are analyzed for this alternative.

Table 4-5 NEPA Assessment of Resources for FM5/REC6

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.5.2.3
Hydrology and Water Quality	Analyzed in Section 4.5.2.3
Biological Resources	
Habitats	Analyzed in Section 4.5.2.3
Wildlife Species (including birds)	Analyzed in Section 4.5.2.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)[a]	Does not require additional analysis. Project activities would not include any in-water work and would have no effect on marine and estuarine fauna.
Protected Species	Analyzed in Section 4.5.2.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.5.2.3
Aesthetics and Visual Resources	Analyzed in Section 4.5.2.3
Public Health and Safety	Analyzed in Section 4.5.2.3
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.5.2.2 Affected Environment

SVNWR is a 12,490-acre refuge located in Franklin and Gulf Counties along the Gulf Coast of Florida (USFWS 2012). SVNWR includes St. Vincent Island, Pig Island, a mainland tract, and an office/visitor center in Apalachicola, Florida. The SVNWR staff also oversee 21 Farm Service Agency easements. This proposed project would acquire the easternmost tip of Indian Peninsula near St. Vincent Point to add to SVNWR. Indian Peninsula is bounded to the north by Indian Lagoon, to the east by Indian Pass, and to the south by the Gulf. Indian Lagoon and Indian Pass are part of the larger Apalachicola Bay watershed system. The proposed project area on Indian Peninsula is currently privately owned and developed for recreational purposes. It includes undisturbed habitat and disturbed areas including a private campground.

Physical Resources

The proposed project site ranges from approximately 200-300 feet across. Soil resources at the proposed project site include a mix of fine sands and flooded soils. Approximately 61 percent of soils and sediments are Kureb-Corolla complex, 31 percent are Corolla fine sands, 3 percent are beaches, 3 percent are Duckston-Duckston depressional complex, 1 percent are Bayvl and Direго soils, and the rest is water (USDA-NRCS 2020).

The adjacent Indian Pass serves as a major connection between Apalachicola Bay and the Gulf. Indian Pass and Indian Lagoon are listed as 303(d) impaired waterbody for fecal coliform (FDEP 2020d). Water depths within Indian Lagoon are generally shallow (less than 5 feet) and increase in depth through Indian Pass. The project site is within Federal Emergency Management Agency (FEMA)-designated Flood Zones VE and AE, with flooding depths of 9-11 feet (FEMA 2020).

Biological Resources

The project site is partially developed for recreational purposes and partially undeveloped, undisturbed habitat. The non-developed areas include a mixture of emergent herbaceous wetlands and evergreen forest (U.S. Geological Survey [USGS] 2016). Recreational access upgrades on the peninsula could overlap estuarine and marine wetlands.

Wildlife potentially present in and around the project site include migratory birds and select terrestrial protected species. Migratory birds could potentially use this site for resting and foraging. Bird and sea turtles may also utilize coastal habitat at the project site, including piping plover, red knot, green sea turtle, Kemp's ridley, leatherback sea turtles, and loggerhead sea turtles. The list of federally threatened, endangered, proposed, candidate, and other species of concern for this site, as identified through USFWS IPaC, is presented in Appendix E (USFWS 2018). Federally designated critical habitat for loggerhead sea turtle (LOGG-T-FL-41) is present at the project site.

Socioeconomic Resources

A private campground (Indian Pass campground) currently exists on the proposed project site that includes RV sites, tent sites, and cabins. All camp sites have associated concrete camper pads and fire rings. Unpaved parking and roads exist throughout the project site. A boat ramp, dock (which is currently leased by SVNWR), and boat storage facility provide water access to Apalachicola Bay and the Gulf. Various support infrastructure (e.g., fishing cleaning station, bathroom and showers, dump station) service the private campground. An approximately 400 square feet wooden office building serves as a contact station for campground visitors; the building roof is covered in tarps.

In addition to the campground amenities listed above, other infrastructure exists on the site including an empty aboveground gasoline tank, aboveground propane tanks, sheds, well and pump motor, chain-link fence, singlewide trailer, fish-cleaning pole, in-ground pool, septic tanks, wells, and a grid of underground electric and water lines and sewage lines.

4.5.2.3 Environmental Consequences

Physical Resources

Implementation of this project could include use of heavy construction equipment to construct the gravel kayak launch area and parking facilities and to re-roof and remodel the existing visitor store. Equipment could include bulldozers, trucks, construction trailers, backhoes, tractor trailers, cranes, small excavators, forklifts, generators, augers, and a variety of power tools.

This project would not include in-water work, as the kayak launch would consist only of construction of a new, unpaved gravel parking area with 10 spaces near the shoreline for individuals to access the water with no launch structure. Increased use of the gravel kayak launch area could disturb sediments and soils in the long-term by increasing activity near the shoreline, potentially disturbing sediments and increasing turbidity. During construction near the water, BMPs and boom placement along with other avoidance and mitigation measures required by state and federal regulatory agencies could be employed to minimize any water quality and adverse sedimentation impacts to Indian Lagoon, Indian Pass, or the Gulf.

Construction activities would occur in the terrestrial environment to construct an unpaved parking area with 10 spaces, expand the existing unpaved parking lot from 14 to 31 spaces, and re-roof and remodel the existing visitor center to comply with federal building codes (e.g., ADA accessibility, fire exit signs).

Construction and digging activities, including staging areas for construction equipment, would utilize existing development footprints and disturbed areas where possible (e.g., existing roads, paved areas), but digging and staging equipment would disturb some soils. Construction vehicles would enter the site from the nearby highway (i.e., there would not be any water-based access). Terrestrial construction activities may temporarily affect hydrology and water quality.

Specific mitigation measures would be implemented during construction to minimize erosion and overall adverse soil impacts. Construction involving ground disturbances from proposed improvements and site preparation activities would have minor short- and long-term adverse impacts on geology and substrates. This project would result in short-term minor adverse impacts on water quality and hydrology due to the construction of the improvements, but long-term adverse impacts would be mitigated by installing pervious pavement for the parking lot.

In summary, the project is anticipated to result in short- and long-term minor adverse impacts to physical resources.

Biological Resources

As noted above, this project would not include in-water work. As such, the FL TIG does not anticipate any effects to marine and estuarine fauna (including protected species), EFH, or SAV. Construction activities on land associated with this project could result in short-term adverse impacts to aquatic habitat due to erosion and increased turbidity during construction. The release of sediments during construction would be controlled using BMPs and mitigation to protect aquatic habitat, prevent the transport of sediment into waterways, confine adverse impacts to construction sites, and minimize the magnitude of adverse impacts on water quality.

Construction activities would avoid existing trees and habitat areas where possible and feasible. Specific conservation measures would be implemented during the finalization of engineering and design plans and construction to minimize erosion, habitat fragmentation, runoff, protected species adverse impacts, and overall adverse habitat impacts. Construction equipment and staging areas could negatively impact habitat, but as noted previously, to the greatest extent possible, all activities would take place on existing development footprints to minimize adverse impacts. These could include following established BMPs for construction activities such as the implementation of an erosion control and stormwater management plan, the installation of sediment traps prior to commencement of construction activities, and ongoing construction monitoring to ensure compliance. Construction activities would result in short-term, minor adverse impacts to habitats and terrestrial wildlife.

The recreational improvements to the area, including the kayak launch and increase in parking, has the potential to result in an increase in visitors, which could result in long-term, minor adverse impacts to wildlife and habitats due to increased noise and activity. However, there may also be long-term benefits to wildlife and habitats due to improved management of natural resources as part of the SVNWR. Further, although recreational fishing activity may increase due to the improvements, monofilament recycling bins would be placed at the project site to reduce adverse impacts of fishing gear on protected species.

The FL TIG has completed technical assistance with relevant regulatory agencies related to potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status. Conservation measures recommended during coordination would be incorporated

into project implementation to avoid and/or minimize adverse impacts to protected species and critical habitats. Specific conservation measures would also be implemented during construction to avoid and minimize disruption and overall adverse impacts to protected species. Potential protected species at the project site, effects from the project activities, and potential conservation measures, including the following:

Sea turtles: Sea turtles, including green, Kemp's ridley, leatherback, and loggerhead sea turtles have been observed swimming or feeding on seagrasses within Apalachicola Bay. Turtle nesting does occur on St. Vincent Island and the Indian Peninsula where project activities would occur. There is potential for sea turtle encounters during construction and after construction with private vessels using the paddlecraft launches. However, with mitigation it is anticipated that the proposed action may have short-term, minor adverse impacts to sea turtle species.

In summary, this project is anticipated to result in short-term minor adverse impacts on biological resources but is anticipated to result in long-term benefits through securing access for continued management in perpetuity at SVNWR lands.

Socioeconomic Resources

The use of construction equipment and barriers enacted to protect public safety would result in some minor to moderate short-term adverse impacts on aesthetics and visual quality at the site. These impacts would result from the presence of equipment, barriers, and construction-related dust and emissions. During the construction period, visible impediments would detract from the natural landscape and create visual contrast for observers. Further, during construction activities, short-term closures of some areas may be required to accommodate construction activities, which could adversely affect visitors. This project would also be expected to result in a short-term increase in construction jobs.

While the site would no longer include a private fee-based campground, the site would be managed as part of the SVNWR, and public access would be more widely available. There would be enhanced fishing opportunities from the proposed project based on increased parking and the addition of the gravel kayak launch area. There is also the potential for highly desirable fishing experiences due to the unique location of the site at the pass to the Gulf. Increased parking and water access for non-motorized boating would also create new opportunities for recreation.

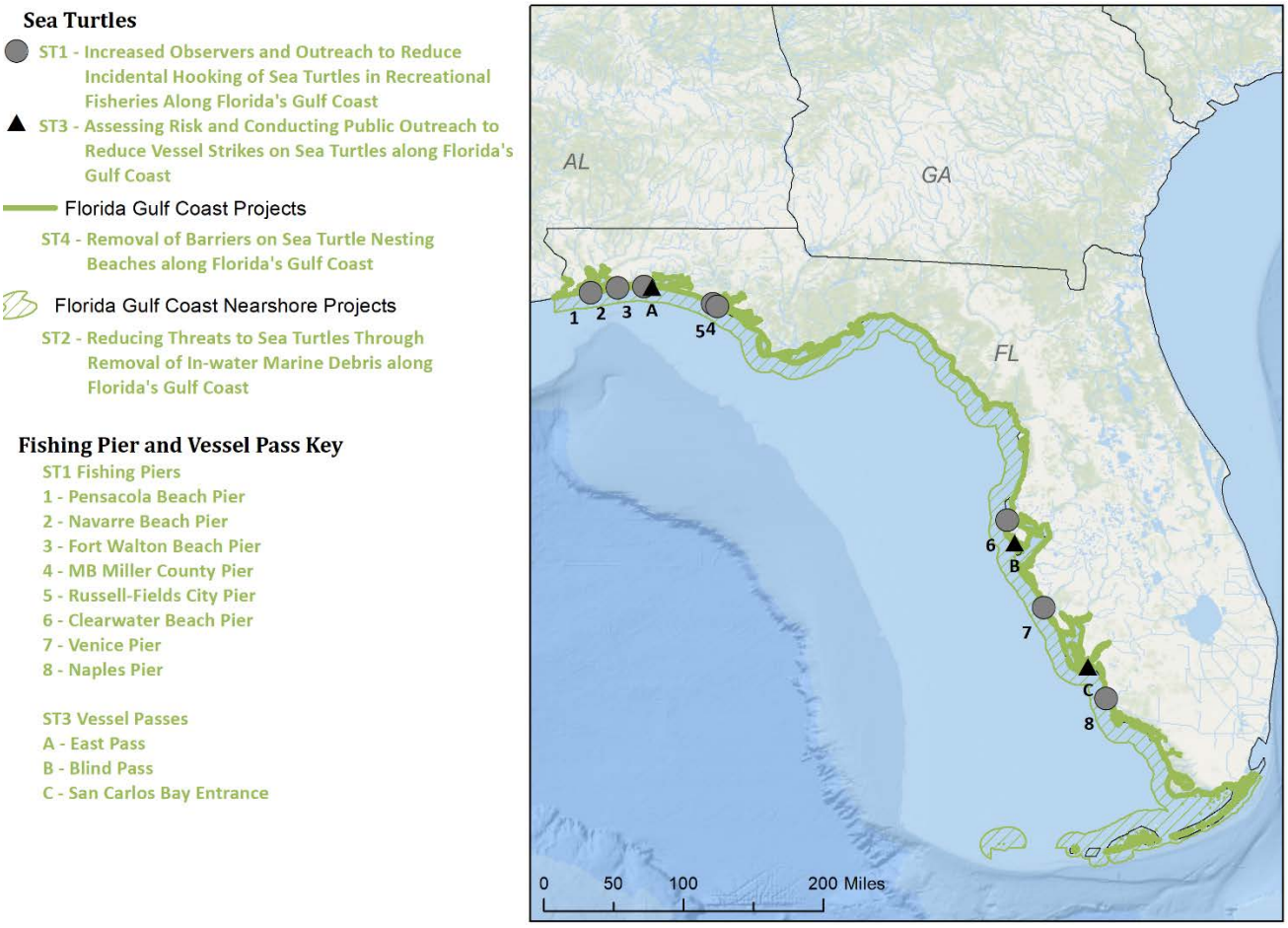
In summary, this project is anticipated to result in minor, short-term adverse impacts, as well as short and long-term benefits to socioeconomic resources.

4.5.3 No Action

Under the No Action alternative, the improvements to habitat on federally managed lands proposed in this RP/EA would not occur and potential short-term and temporary adverse impacts to physical and biological resources associated with beach renourishment, invasive species control, and predator management would not occur. If the projects are not implemented, minor to moderate adverse impacts to habitats and species are anticipated including: disturbance to bird and sea turtle nesting, sea turtle hatchling disorientation due to beach lighting, beach and dune habitat trampling, trash accumulation, and continued sand loss along Perdido Key due to reduced sand input from littoral drift. In summary, under the No Action alternative, no short-term and temporary adverse impacts to physical and biological resources would occur, but also no long-term benefits would be realized.

4.6 Sea Turtles

Figure 4-2 Sea Turtles project location



The four projects under the Sea Turtles Restoration Type include activities which would occur across Florida's Gulf Coast (Figure 4-2):

- **ST1, Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast (preferred).**
- **ST2, Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast (preferred).**
- **ST3, Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast (preferred).**
- **ST4, Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast.**

4.6.1 ST1, Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast (Preferred)

This project would reduce incidental capture of sea turtles at eight fishing piers along Florida's Gulf Coast and improve outcomes for hooked and captured sea turtles, ultimately reducing overall mortality. The project goal is to develop a response strategy for sea turtles hooked or captured incidentally at Gulf

fishing piers. As described in Chapter 2 (Section 2.5.2), most project activities such as observational data gathering, convening expert working groups, and providing educational materials would have minimal environmental consequences (Section 4.4.2). Activities most relevant to assessment of the environmental consequences for this project include:

- Establishing FWC (state) observers on piers (Figure 4-2) during periods with high-reported capture rates; and,
- Responding to hooked sea turtles, including handling and transport or coordination with the existing Marine Turtle Permit Holder network.

4.6.1.1 Resources Analyzed in Detail for this Alternative

Table 4-6 identifies how potentially affected resources are analyzed for this alternative.

Table 4-6 NEPA Assessment of Resources for ST1

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.6.1.3
Hydrology and Water Quality[a]	Does not require additional analysis. Project activities would not impact hydrology or water quality.
Biological Resources	
Habitats	Analyzed in Section 4.6.1.3
Wildlife Species (including birds)	Analyzed in Section 4.6.1.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.6.1.3
Protected Species	Analyzed in Section 4.6.1.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.6.1.3
Aesthetics and Visual Resources	Analyzed in Section 4.6.1.3
Public Health and Safety[a]	Does not require additional analysis. Project activities would not impact public health and safety.
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.6.1.2 Affected Environment

This project would establish state observers at eight fishing piers across seven Florida Gulf Coast counties: Pensacola Beach Pier (Escambia County), Navarre Beach Pier (Santa Rosa County), Fort Walton Beach Pier (Okaloosa County), MB Miller County Pier and Russell-Fields City Pier (Bay County), Clearwater Beach Pier (Pinellas County), Venice Pier (Sarasota County), and Naples Pier (Collier County) (Figure 4-2). The pier lengths vary from approximately 700 feet (Venice Pier) to over 1,800 feet (Clearwater Beach Pier). Water depths range from 10-30 feet at the seaward termination of each pier. A brief description of the affected environment for physical, biological, and socioeconomic resources is

provided below, additional details are provided in Section 4.6.2.2, the affected environment description for the Florida Gulf Coast.

Physical Resources

The eight coastal fishing piers are built on sandy barrier islands in highly developed locations. Pier bases are typically situated near parking lots or roads, extend over sandy dunes and beaches, and terminate in nearshore waters. Substrates around and directly under the piers are primarily unconsolidated fine sand and shells and include the following complexes: Mandarin sand, Canaveral-Beaches complex, Newhan-Corolla complex, Matlacha and St. Augustine soils, and Corolla-Duckston sands (USDA-NRCS 2020). These substrates are highly disturbed due to coastal development (including roads, parking lots, and buildings) and extensive foot traffic in and around developed pier locations.

Biological Resources

Undeveloped habitats around the eight fishing piers are primarily beach and vegetated primary dunes. These habitats are subject to high levels of natural and human-caused disturbance due to storms and their proximity to highly developed commercial and recreational areas. The fishing piers attract tourists and residents and host amenities such as bars, restaurants, and shops. Dune crossovers have previously been constructed around most of the fishing piers to limit foot traffic disturbance on sensitive dune habitats. Marine habitats around the piers are soft, sandy bottoms.

Common mammal species found near the fishing piers include marsh rabbit, eastern cottontail rabbit, opossum, squirrel, skunks, gray fox, raccoon, eastern wood rats, hispid cotton rats, eastern moles, southeastern pocket gophers, short-tailed shrews, and a variety of bats. See Section 4.6.2.2 for information on birds and other wildlife that utilize the beach, dune, and marine habitats near the piers. Federally listed species in the project area, as identified through USFWS IPaC, are listed in Appendix E (USFWS 2018).

Socioeconomic Resources

As noted above, this project would involve activities conducted at eight existing fishing piers located in seven Florida Gulf Coast counties (Escambia, Santa Rosa, Okaloosa, Bay, Pinellas, Sarasota, and Collier County). Florida Gulf Coast county demographics are located in Appendix D. All of the piers except the Pensacola Beach Pier (Escambia County) are publicly owned, and all of the piers except the Venice (Sarasota County) and Naples (Collier County) piers require a fee to use. Recreational activities associated with these fishing piers include visitation, wildlife viewing, and fishing, among others. These activities provide economic benefits and sources of employment for local communities.

4.6.1.3 Environmental Consequences

Pier observers established through this project would passively gather observational data on existing fishing activities at each of the eight piers. In the event of a hooked sea turtle, the observers would be permitted to respond to, handle, and transport sea turtles to appropriate rehabilitation centers. Response, handling, and transport activities would follow STSSN protocols, which include using bridge nets to rescue turtles from the marine environment and transporting them to the nearest rehabilitation center so they can be examined for hooks or fishing line. Section 6.4.7.6 of the PDARP/PEIS analyzes the environmental consequences of enhancing STSSN-related activities and is referenced below (DWH Trustees 2016a).

Physical Resources

As concluded in the PDARP/PEIS, responding to sea turtles "could result in localized, long-term, minor adverse impacts to physical resources associated with human activities and use of equipment during mobilization of stranding and response efforts on beaches" (DWH Trustees 2016a). Minor erosion may occur as a result of foot traffic along dunes and beaches during response activities. Where possible, state observers would use existing dune crossovers at the eight fishing piers to access the water during response activities to mitigate adverse impacts on the geology and substrate of dunes and beaches.

In summary, this project is anticipated to result in localized, long-term minor adverse impacts to geology and substrates.

Biological Resources

Responding to hooked sea turtles could result in temporary, long-term, minor adverse impacts to dune and beach habitats and wildlife (including protected species) therein associated with foot traffic. To minimize adverse impacts to vegetated dune and beach habitat or wildlife, state observers would use existing dune crossovers or beach access points where possible during response activities. Response activities may also have temporary, minor adverse impacts on marine and estuarine fauna due to the use of bridge nets to retrieve hooked sea turtles. However, as previously described, permitted state observers would follow STSSN protocols, decreasing opportunities to incidentally net non-target fauna. Response-related adverse impacts to habitats, wildlife, and marine and estuarine fauna would be temporary and cease once response activities were concluded.

If a state observer witnesses a sea turtle hooking by recreational gear from the pier, the observer would use a bridge net to retrieve the sea turtle from the marine environment and transport the turtle to the nearest rehabilitation center for evaluation. The observer may coordinate with the STSSN for responding to and transporting hooked sea turtles. As concluded in NMFS ESA Section 7 BO to Authorize Response to Stranded Endangered Sea Turtles and the USFWS ESA Section 7 Programmatic BO for Section 10(a)(1)(A) Permit Application, STSSN-related activities of rescuing and rehabilitating sea turtles are likely to adversely affect but not likely to jeopardize the continued existence of green, hawksbill (*Eretmochelys imbricata*), Kemp's ridley, leatherback, or loggerhead sea turtles (NMFS 2016b, USFWS 2015). Response and transportation may result in short-term stress to individual sea turtles, but this is not likely to result in long-term adverse effects on these individuals, sea turtle populations, or sea turtle species (NMFS 2016b). Based on these existing determinations, this project would have short-term, moderate adverse impacts on sea turtles. The FL TIG has completed technical assistance with relevant regulatory agencies related to potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status.

This project is expected to provide short- and long-term benefits to sea turtle species by improving the outcome and reducing mortality of incidentally hooked sea turtles. Rescuing and rehabilitating hooked sea turtles would have long-term beneficial effects since rehabilitated individuals can be returned to the marine environment and are able to reproduce (NMFS 2016b). There are currently no protocols in place to report or respond to sea turtle hooking events at recreational fishing piers. As such, sea turtles can experience severe injury or mortality due to entanglement in, ingestion of, or injury from hook-and-line fishing gear. During this project, state observers placed at fishing piers would be permitted to respond to, handle, or transport hooked sea turtles under an existing ESA Section 6 agreement with the USFWS, Florida Statute 379.2431(1), Florida Administrative Code Rule 68E-1, and 50 CFR §222.310.

Other marine species that are known to interact with recreational fishing gear (including, but not limited to the West Indian manatee, bottlenose dolphins, Gulf sturgeon, and smalltooth sawfish (*Pristis pectinata*) may also experience short- and long-term benefits from project activities. While pier observers as part of this project would only respond to/handle hooked sea turtles, observers would report hooking events for other species to the appropriate response organization (e.g., the MMSN for hooked marine mammals). Better reporting of these events could improve outcomes of hooked marine species through response and rescues activities unrelated to this project.

In summary, this project is anticipated to result in short-term, minor localized adverse impacts to biological resources and short- and long-term benefits to sea turtles.

Socioeconomic Resources

Section 6.4.7.7.3 of the PDARP/PEIS, which describes the impacts to socioeconomic resources from approaches intended to restore sea turtles, is incorporated here by reference. Long-term, minor adverse impacts to socioeconomic resources could occur if developed and implemented conservation measures disrupt recreational fishing through voluntary temporal or location fishing restrictions. However, conservation measures implemented as part of this project may also improve recreational fishing experiences by creating standardized response protocols for hooked turtles and reducing hooking incidences. Wildlife viewers would also benefit by observing fewer hooked or injured turtles at fishing piers or along beaches.

In summary, this project is anticipated to result in negligible to minor adverse impacts and long-term benefits to socioeconomic resources.

4.6.2 ST2, Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast (Preferred)

This project would reduce the number of and potential for marine debris-related incidences with sea turtles (e.g., entanglement, entrapment, ingestion) along Florida's Gulf Coast with a primary focus on in-water derelict fishing gear (e.g., monofilament fishing line, nets, trap/pot gear, and other recreational/commercial fishing equipment that has been lost, abandoned, or discarded). Activities most relevant to assessment of the environmental consequences include:

- Removing marine debris at up to 16 hotspots. This includes providing support (e.g., capacity, equipment, fuel) for debris removal events, including the use of professional divers or marine salvage crews around deep structures. There is the potential for debris removal to be a one-time or multi-event effort depending on the degree/frequency of debris accumulation, impact on sea turtles, cost, and logistics. Debris removal may be conducted in coordination with or to enhance existing marine debris networks (e.g., Gulf Coast clean-ups) or as additional stand-alone events.
- Increasing capacity and approaches for fishing gear collection and disposal (e.g., monofilament recycling bins, arrangement of maintenance services, expanding sustainable disposal options).

4.6.2.1 Resources Analyzed in Detail for this Alternative

Table 4-7 identifies how potentially affected resources are analyzed for this alternative.

Table 4-7 NEPA Assessment of Resources for ST2

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.6.2.3
Hydrology and Water Quality	Analyzed in Section 4.6.2.3
Biological Resources	
Habitats	Analyzed in Section 4.6.2.3
Wildlife Species (including birds)	Analyzed in Section 4.6.2.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.6.2.3
Protected Species	Analyzed in Section 4.6.2.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.6.2.3
Aesthetics and Visual Resources	Analyzed in Section 4.6.2.3
Public Health and Safety	Analyzed in Section 4.6.2.3
Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.6.2.2 Affected Environment

This section describes the Affected Environment for the projects with activities that span large areas of the Florida Gulf Coast along the shoreline and in nearshore waters (ST1, ST2, ST3, ST4, MM1, B4, and B5). Florida's Gulf Coast extends from Perdido Key, across the Panhandle, to the Big Bend, south to the Everglades, and includes the Florida Keys. On the Gulf Coast, the Florida coastline is more than 700 miles long. Across that area, there are more than 5,000 total miles of shoreline, which includes offshore islands, sounds, bays, rivers, and creeks to the head of tidewater.[58] For the purposes of this RP/EA, the affected environment includes upland areas immediately adjacent to the shoreline, intertidal and shallow subtidal environments, bays and estuaries, and nearshore continental shelf. This is a vast area, consisting of a diverse network of organisms, as described in detail in Chapter 3 Ecosystem Setting and Chapter 4 Injury to Natural Resources of the PDARP/PEIS (DWH Trustees 2016a), which are incorporated here by reference.

Physical Resources

This section describes the geology, substrates, hydrology, and water quality of the Florida Gulf Coast. Florida's shoreline consists of beaches and dunes, coastal strands, coastal uplands, and maritime hammock. Along the shoreline are many miles of barrier islands, tidal bays and estuaries, and vast acres of nearshore continental shelf environment. Maximum depths in this area of the continental shelf range from 20-30 meters.

The substrates within the range of the projects analyzed in this RP/EA are quite diverse and vary depending on location. Substrates along the Florida coastline consist primarily of unconsolidated fine sand and shells and include the following complexes: Mandarin sand, Canaveral-Beaches complex, Newhan-Corolla complex, Matlacha and St. Augustine soils, and Corolla-Duckston sands (USDA-NRCS

[58] Source: NOAA Shoreline Website at shoreline.noaa.gov/faqs.html?faq=2.

2020). Large areas of coastal substrates are highly disturbed due to coastal development (including roads, parking lots, and buildings) and extensive foot traffic in and around developed areas. The nearshore benthic substrates generally consist of sand, silt, clay, hard bottom substrates, and vegetation. The predominant sediment grain size in nearshore areas is typically sand that becomes increasingly finer with increasing distance from the shore. Areas that include consolidated, hard bottom substrates are also present across the nearshore subtidal environment and the coastal shelf of Florida.

The Florida coastline and nearshore environment is strongly influenced by coastal watersheds and drainage systems, which includes rivers and freshwater springs. From west to east, watersheds that are hydrologically connected to the Gulf include Perdido, Pensacola, Choctawhatchee-St. Andrew, Apalachicola-Chipola, Ochlockonee-St. Marks, Suwannee, Springs Coast, Tampa Bay, Sarasota Bay-Peace-Myakka, Charlotte Harbor, Caloosahatchee, Everglades West Coast, Everglades, and Florida Bay/Florida Keys. Freshwater from watersheds enters coastal waters, discharging sediments, nutrients (e.g., nitrogen, phosphorus), and contaminants from industrial wastewater discharge and urban and agricultural runoff. Oceanic circulation patterns influence water quality by dispersing and diluting coastal waters. Salinity, temperature, and turbidity in nearshore coastal waters are also strongly influenced by freshwater inputs. Turbidity off the coast of Florida is relatively low due to the carbonate sediments.

Biological Resources

This section describes the habitats, marine and estuarine fauna, and wildlife across the Florida Gulf Coast, including protected species, critical habitat, and EFH for federally-managed fish species. Florida's upland and marine environment are biologically diverse, with more than 16,000 species of plants and animals (FWC 2019a).

Florida's Gulf Coast upland habitats are subject to high levels of natural and human-caused disturbance due to storms and human use. Beaches and other coastal areas attract tourists and residents; however, developed and undeveloped coastal uplands provide habitat for a large number of terrestrial wildlife, including the marsh rabbit, eastern cottontail rabbit, opossum, squirrel, skunks, gray fox, raccoon, eastern wood rats, hispid cotton rats, eastern moles, southeastern pocket gophers, short-tailed shrews, and a variety of bats. More than 280 species of birds use beach and dune habitats and barrier islands for loafing, nesting, feeding, wintering, or migratory rest stops. These birds include songbirds, waterfowl, wading birds, birds of prey, seabirds, and shorebirds. Sandpipers, herons, egrets, ospreys, marsh wrens, terns, gulls, and several species of rails are just a few species that use these habitats. Shorebirds that nest, forage, and loaf along the shoreline are managed through monitoring and stewardship activities (e.g., posting, roping, signage), law enforcement, and closures (e.g., Critical Wildlife Areas) especially during the breeding season to alleviate adverse impacts to solitary-nesting shorebirds (e.g., American oystercatcher [*Haematopus palliates*], snowy plover [*Characrius nivosus*], Wilson's plovers [*Characrius wilsonia*]) and colonial-nesting seabirds (e.g., black skimmers, brown pelican [*Pelecanus occidentalis*], terns, gulls). Great blue heron, night heron, and osprey also nest in these areas.

Bays, estuaries, nearshore, and continental shelf marine waters provide habitat for a very large and diverse number of plant and animal species. Vegetated habitats along the coastline include marsh, mangrove, beach and coastal grasslands, strands, and hammocks. The intertidal zone, shallow subtidal, and nearshore coastal shelf provide habitat from several species of seagrass and a large diversity of algal species. Vast areas of unconsolidated sediments further support diverse assemblages of epibenthic and

infaunal organisms. Areas with hardbottom provide substrate for oysters and coral, both of which are reef building and can develop complex reef communities. Pelagic *Sargassum*, which floats on the surface of the Gulf, also supports high diversity of invertebrates, pelagic fish, birds, and sea turtles. Each of these habitat types provide immense value to Gulf animals for refuge, nursery, nesting, and foraging.

More than 200 species of fish occur within Florida's Gulf Coast nearshore waters including several commercially and recreationally important species. Recreationally important species include bluefish (*Pomatomus saltatrix*), pompano (*Trachinotus carolinus*), red drum, Spanish mackerel, spotted seatrout (*Cynoscion nebulosus*), flounder (*Paralichthys sp.*), cobia, tarpon (*Megalops atlanticus*), and sheepshead (*Archosargus probatocephalus*). Gulf Coast waters include federally designated EFH for shrimp, red drum, coastal migratory pelagics, reef fish, and swordfish (*Xiphias gladius*) (NOAA 2018). Federally protected fish species such as Gulf sturgeon and smalltooth sawfish also inhabit nearshore coastal waters. Nearshore waters along the Florida Panhandle are designated critical habitat for Gulf sturgeon.

All five sea turtle species that inhabit Gulf Coast waters (green, hawksbill, Kemp's ridley, leatherback, and loggerhead) are present in Florida. The leatherback, Kemp's ridley, and hawksbill are listed as federally endangered; the Atlantic distinct population segment (including the Gulf) of loggerhead and green turtles are listed as federally threatened. Various nearshore and beach sites along Florida's Gulf Coast are designated critical habitat for loggerhead sea turtles.

Numerous cetacean species are present in Florida Gulf Coast waters, specifically, the Northern Gulf of Mexico Stock of Atlantic spotted dolphin (*Stenella frontalis*) and all bay, sound, and estuary stocks of bottlenose dolphins along Florida's Gulf Coast and the Gulf of Mexico Eastern Coastal, Northern Gulf of Mexico Continental, and Gulf of Mexico Northern Coastal Stocks of bottlenose dolphins (Hayes et al. 2020). West Indian manatee also occur throughout Florida's nearshore waters.

The current federal species list, as identified through IPaC, is summarized in Appendix E (USFWS 2018).

Socioeconomic Resources

Twenty-three counties line Florida's Gulf Coast, with a total population of nearly 8 million people, representing nearly a third of Florida's total population. Population and housing density along the shoreline in Florida are almost three times larger than inland counties (Kildow 2008). Coastal counties support over 30 percent of Florida's statewide employment and wages (Kildow 2008). Tourism and recreation contribute substantially to coastal economies in Florida, contributing over $17 billion to the State in 2013 (NOEP 2016). Recreational activities in nearshore areas include beach visitation, boating, fishing, swimming, snorkeling and scuba diving, among others. These activities provide economic benefits and sources of employment for local communities. Commercial fishing also contributes substantially to the economies of the Gulf Coast of Florida. The Gulf Coast has landed 70-75 percent of Florida's domestic seafood catch by weight and 70-80 percent by value, on average (Kildow 2008). The Gulf Coast of Florida brought in 75.2 million pounds of commercial seafood, valued at $203 million in 2014 (NOEP 2016). Marine transportation and marine construction also contribute substantially to the coastal economy of Florida's Gulf Coast. Florida Gulf Coast county demographics are located in Appendix D.

4.6.2.3 Environmental Consequences

The Programmatic Environmental Assessment for the NOAA Marine Debris Program provides relevant NEPA analysis (hereafter referred to as the MDP PEA; NOAA 2013). The MDP PEA did not identify

adverse impacts associated with MDP activities and determined that an EIS was not necessary. Furthermore, the effects of marine debris removal activities similar to those proposed in this project, are described in Section 6.4.5.1 of the PDARP/PEIS for restoration of fish and water column invertebrates (DWH Trustees 2016a). Section 5.2 of the MDP PEA and Section 6.4.5.1 of the PDARP/PEIS both describe the impacts to resources from marine debris removal activities and are incorporated here by reference.

Physical Resources

Marine debris removal may result in minor, short-term adverse impacts on the physical environment from disturbance to existing substrates from gear-removal devices. There may be short-term, minor adverse impacts to water quality and benthos during surveys and debris-removal events that require the use of vessels.

Long-term benefits to physical resources are expected. Existing marine debris currently adversely impacts benthic substrates. Water quality would improve through the removal of derelict fishing gear and other marine debris originating from land-based sources that pollute marine and estuarine habitats. Plastic debris does not decompose through microbial processes, but eventually breaks down into smaller particles (i.e., microplastics), which pose an ingestion risk to marine life. Plastics can also potentially act to transport pathogens and chemical contaminants of concern. Thus, reducing the volume of marine debris would lead to long-term improvements in water quality.

In summary, this project is anticipated to result in short-term, minor adverse impacts and long-term benefits to physical resources.

Biological Resources

Short-term, minor adverse impacts to habitats and terrestrial and marine wildlife (including protected species) may occur as a result of marine debris removal activities. Adverse impacts could occur from increased human and/or vessel presence, noise, and construction equipment. In-water work would involve pre-removal activities such as scoping, removal of in-water debris (including associated vessels/equipment), and transporting removed debris to upland disposal sites. The level of adverse impact to habitats and species would depend on the type of debris being removed and the method of removal. For example, benthic organisms, including benthic invertebrates, fish, and plants, may be disturbed during mechanical debris removal. Potential marine debris removals would be evaluated using a habitat sensitivity index to determine potential vulnerable nearby habitats and impact concerns. Where needed, natural resource advisors and subject matter experts (e.g., for natural and artificial reefs) would be utilized to determine if a removal is possible or should be left in place and how best to minimize adverse impacts associated with reefs. Removals may involve the use of self-contained underwater breathing apparatus (SCUBA) equipment and boating safety gear, dive knives, hooks, floats, lift bags, and barges or other heavy construction equipment such as cranes, buckets and grapples, rigging, backhoes, excavators, hoists and winches, water jets, booms, boats, and dumpsters.

Pre-removal activities such as scoping and staging and post-removal activities such as transporting debris to disposal sites would occur within upland habitats. To the greatest extent possible, upland activities would occur within previously disturbed or otherwise developed areas to reduce adverse impacts related to pre- and post-removal. Additionally, beach and dune habitats would be avoided during sea turtle, shorebird, and seabird nesting season to minimize adverse impacts from human

disturbance. The FL TIG has completed technical assistance with relevant regulatory agencies related to potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status.

Removing marine debris would have long-term benefits to biological resources by improving the quality of benthic habitat and reducing entanglement and entrapment of sea turtles, marine mammals, fish, and birds. Additionally, as described in the Physical Resources section above, removing marine debris may improve water quality that can benefit benthic habitats and marine resources.

In summary, this project is anticipated to result in short-term, minor adverse impacts and long-term benefits to biological resources.

Socioeconomic Resources

No construction activities are anticipated that would adversely affect socioeconomic resources.

Long-term, socioeconomic benefits are expected to result from marine debris removal. Marine debris can result in beach closures, disabled vessels, damage fisheries, negatively impact navigational safety, and negatively impact recreational use and visual resources. As such, removal of marine debris is expected to result in direct and indirect benefits to socioeconomic resources, including both commercial and recreational boater safety due to reduced entanglement hazards to boat propellers.

In summary, this project is anticipated to result in negligible adverse impacts and long-term benefits to socioeconomic resources.

4.6.3 ST3, Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast (Preferred)

The goal of this project is to reduce the mortality of multiple sea turtle species (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) from injuries due to strikes by motorized watercraft by utilizing data compiled as part of the project to conduct a public awareness campaign to educate the public about sea turtles and the threat of vessel strikes and to promote responsible boating practices. This multi-stage project would obtain information on the distribution of sea turtles and vessels in areas previously identified as hotspots of vessel strike mortality of sea turtles and assess the willingness of local communities to change their behavior to reduce the risk of watercraft-related mortality of sea turtles. As described in Chapter 2 (Section 2.5.2), most project activities such as observational data gathering and providing educational materials would have minimal environmental consequences (Section 4.4.2). Activities most relevant to assessment of the environmental consequences of this project include:

- Vessel-based surveys at East Pass (Walton County), Blind Pass (Pinellas County), and San Carlos Bay Entrance (Lee County) to:
    - Quantify vessel use and activity at the passes; and,
    - Obtain information to determine the overlap between sea turtles and vessels at the passes to identify areas with low, medium, and high risk of a vessel strike, and the factors that may influence the risk of a vessel strike.

4.6.3.1 Resources Analyzed in Detail for this Alternative

Table 4-8 identifies how potentially affected resources are analyzed for this alternative.

Table 4-8 NEPA Assessment of Resources ST3

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates[a]	Does not require additional analysis. Project activities would not impact geology and substrates since all activities would take place in offices, laboratories, and open water areas.
Hydrology and Water Quality[a]	Does not require additional analysis. Project activities would not impact hydrology and water quality.
Biological Resources	
Habitats	Analyzed in Section 4.6.3.3
Wildlife Species (including birds)	Analyzed in Section 4.6.3.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.6.3.3
Protected Species	Analyzed in Section 4.6.3.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.6.3.3
Aesthetics and Visual Resources[a]	Does not require additional analysis. Project activities would not change the visual landscape.
Public Health and Safety[a]	Does not require additional analysis. Project activities would not impact public health and safety.
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.6.3.2 Affected Environment

This project would conduct sea turtle surveys and observation at three passes in three Florida Gulf Coast counties: East Pass (Walton County), Blind Pass (Pinellas County), and San Carlos Bay Entrance (Lee County) (Figure 4-2). All three passes are open to recreational vessel use, and these passes are typically used to access the Gulf from permanent moorings within the associated bays. East Pass has an average channel depth of 15-20 feet, Blind Pass has an average channel depth of 10 feet, and San Carlos Bay Entrance has an average channel depth of 15 feet, although all three passes have shallower and deeper areas. A brief description of the affected environment for physical, biological, and socioeconomic resources is provided below, additional details are provided in Section 4.6.2.2, the affected environment description for the Florida Gulf Coast.

Physical Resources

The three vessel passes serve as important connections between the Gulf and bay and estuarine systems. Freshwater flows from watersheds into bays that empty to the Gulf through the three passes, transporting sediment and contaminants. The three passes also serve as tidal connections between the Gulf and partially enclosed bays. Substrates around the three passes are primarily unconsolidated sandy benthos, especially within the main navigation channel. All three passes are subject to maintenance dredging to maintain navigational access. Two of the three passes contain areas that are 303(d) listed impaired waterbodies: East Pass for bacteria and nutrients and San Carlos Bay Entrance fecal coliform and nutrients (FDEP 2020d).

Biological Resources

Habitats within and around the three passes are highly disturbed or developed due to maintenance dredging of navigational channels and high recreational and commercial vessel activity. Additionally, uplands around the three passes are highly developed urban areas. Various marine and estuarine wetland and deepwater designations exist throughout the three passes. Mangrove habitat is present along the edges of East Pass and San Carlos Bay entrance, and SAV beds are present within all three passes. EFH for coastal migratory pelagics, shrimp, reef fish, red drum, and spiny lobster overlap with the three passes (NOAA 2018). The three passes contain habitat for various marine and estuarine fauna including fish (such as Gulf sturgeon, smalltooth sawfish, and recreational species), invertebrates, seabirds, marine mammals (such as bottlenose dolphin and West Indian manatee), and reptiles (such as sea turtles). See Section 4.6.2.2 for information on birds and other wildlife that utilize the nearshore habitats near the vessel passes. Federally listed species in the project area, as identified through USFWS IPaC, are listed in Appendix E (USFWS 2018).

Socioeconomic Resources

Refer to Section 4.6.2.2 for a summary of the affected environment for socioeconomic resources.

4.6.3.3 Environmental Consequences

The environmental consequences of projects intended to reduce injury and mortality of sea turtles from vessel strikes were evaluated in Section 6.4.7.7 of the PDARP/PEIS (DWH Trustees 2016a), which is incorporated here by reference.

Physical Resources

As noted in Table 4-8, all physical resources are either addressed in Section 4.3 or do not require additional analysis.

Biological Resources

This project may result in minor, short-term adverse impacts to marine habitats and fauna for the duration of the in-water survey work. In-water surveys, including the use of boats and research nets to capture sea turtles, could disrupt habitats and marine fauna. These negative impacts would be localized to where the surveys are being conducted and would subside once surveys are complete. Research permits from FWC and NMFS have already been obtained. All required permit conditions would be implemented to reduce adverse impacts on ESA-listed sea turtles and other federally-protected marine species. The FL TIG has completed technical assistance with relevant regulatory agencies regarding potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status.

Long-term beneficial effects on sea turtle populations would be observed with a potential reduction of sea turtle injury and mortality from vessel strikes. Reductions in vessel strikes would have benefits for adult and juvenile Kemp's ridley, loggerhead, and green sea turtles. Adult and juvenile sea turtles are extremely valuable to the population, as they are either already reproductively active or have a high likelihood of surviving to reproduce.

In summary, this project is anticipated to result in short-term, minor adverse impacts to biological resources and long-term benefits to sea turtles.

Socioeconomic Resources

This project may result in short-term, minor adverse impacts to recreational boaters during survey activities if boaters need to avoid sampling nets. However, the survey efforts would attempt to characterize boat and sea turtle interactions, so this project would largely include observing existing boating conditions at each pass. Because this project is primarily focused on information-gathering, few adverse impacts to socioeconomic resources anticipated, and any changes undertaken by recreational boaters during the public outreach campaign would be voluntary.

In summary, this project is anticipated to result in negligible to minor short-term adverse impacts to socioeconomic resources.

4.6.4 ST4, Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast

The project would restore and improve sea turtle nesting habitat by removing physical shoreline barriers on Florida's Gulf Coast. Physical barriers include man-made and natural permanent and/or semi-permanent barriers to nesting and hatchlings (such as dilapidated sea walls and large logs and trees from storm deposits) and non-permanent barriers (such as abandoned beach furniture and recreational equipment).

As described in Chapter 2 (Section 2.5.2), most project activities such as observational data gathering and providing educational materials would have minimal environmental consequences (Section 4.4.2). Activities most relevant to assessment of the environmental consequences for this project include:

- Develop/implement site restoration plans;
    - Identify potential public and private partners, and work with local stakeholders to implement site plans. At each site, local businesses and organizations would be contacted for their support and collaboration;
    - Contract machinery and other equipment for larger barrier removals. Removed items and materials would be categorized and recorded, sorted, and where appropriate, recycled, thus reducing the impact on local landfills.

4.6.4.1 Resources Analyzed in Detail for this Alternative

Table 4-9 identifies how potentially affected resources are analyzed for this alternative.

Table 4-9 NEPA Assessment of Resources for ST4

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.6.4.3
Hydrology and Water Quality	Analyzed in Section 4.6.4.3
Biological Resources	
Habitats	Analyzed in Section 4.6.4.3
Wildlife Species (including birds)	Analyzed in Section 4.6.4.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)[a]	Does not require additional analysis. Project activities would not occur within the marine environment or impact marine and estuarine fauna.
Protected Species	Analyzed in Section 4.6.4.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.6.4.3
Aesthetics and Visual Resources	Analyzed in Section 4.6.4.3
Public Health and Safety	Analyzed in Section 4.6.4.3
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.6.4.2 Affected Environment

Proposed project activities would occur across the Florida Gulf Coast. A description of the physical, biological, and socioeconomic resources is provided in Section 4.6.2.2. Federally listed species in the project area, as identified through USFWS IPaC, are listed in Appendix E (USFWS 2018).

4.6.4.3 Environmental Consequences

The environmental consequences of projects intended to enhance sea turtle hatchling productivity and restore natural sea turtle nesting habitat were evaluated in Section 6.4.7.3 of the PDARP/PEIS (DWH Trustees 2016a), which is incorporated here by reference.

Physical Resources

Removal of barriers on beaches may involve pedestrian-foot traffic, vehicles, and use of heavy equipment on nesting beaches which would result in minor adverse impacts to geology and substrates. However, these effects are expected to be short-term and would be designed to minimize disturbance to nesting sea turtles and their nests. To the greatest extent possible, barrier removal activities would occur outside nesting seasons for shorebirds and sea turtles. If necessary, screening or caging of nests and nest relocation could have a short-term, minor adverse impacts to affected substrates, but disturbed sites would be restored after placement of screens/cages or removal of turtle eggs. Temporary and minor adverse impacts to hydrology and water quality are also anticipated during removal activities since removal actions could disturb sediments and soils by increasing activity near the shoreline, potentially increasing turbidity.

Consistent with the findings in the PDARP/PEIS, this project is intended to enhance sea turtle hatchling productivity and restore natural habitat and would provide long-term benefits to physical resources.

Efforts to restore sea turtle nesting beaches through barrier removal could provide numerous long-term benefits to beach habitats. Preservation could allow beach and dune migration and sediment migration, which would have long-term beneficial effects on geology and substrates over the life of the project. Conservation could also allow for upland migration as sea level rises and could limit development encroachment. Shoreline habitats landward of the beach (e.g., wetlands) could benefit from adjacent beach and dune area restoration because these areas provide protection from storm surge and reduce erosion.

In summary, this project is anticipated to result in short-term, minor adverse impacts and long-term benefits to physical resources.

Biological Resources

Project implementation may result in short-term, minor to moderate adverse impacts on habitats and terrestrial wildlife due to disturbance from foot traffic, vehicle use, or construction equipment. The extent to which biological resources are negatively impacted would depend on the materials being removed and the method by which removal occurs. However, adverse impacts would be localized and temporary, and conditions would return to baseline once removal activities are complete.

Removing barriers in nesting habitat could result in minor disturbances to nesting sea turtles or other species, such as shorebirds, as a result of human activity and vehicle traffic. To the greatest extent possible, barrier removal activities would occur outside nesting seasons for shorebirds and sea turtles. Nest relocation, if necessary, could result in minor to moderate, short- or long-term adverse effects such as embryo death due to handling, decreased hatching and emergence success, and increased predation of concentrated nests. Adverse effects from implementation of exclusion caging or predator control could occur to species that use the affected area. The FL TIG would coordinate and complete consultation with relevant regulatory agencies, if necessary, on this project regarding potential adverse impacts to protected species and habitats prior to project implementation.

Barrier removal to improve nesting beach quality is expected to provide a long-term benefit to sea turtles by increasing nesting success and hatchling survivorship, resulting in a higher number of sea turtles surviving to adulthood and reproductive life stages. Improving beach habitat is also expected to have long-term benefits for other biological resources that use the beach and adjacent shallow subtidal habitat, including birds, terrestrial wildlife (e.g., beach mice), invertebrates, fish, as well as higher trophic level species that rely on these species.

In summary, this project is anticipated to result in minor to moderate, short- to long-term adverse impacts and long-term benefits to biological resources.

Socioeconomic Resources

Implementation of barrier removals could result in temporary closure or displacement of recreational activities, to the extent that they occur at areas open to the public. Any ground-disturbing restoration activities would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

Benefits to aesthetics, visual resources, recreational experiences, and wildlife viewing from this Restoration Approach could also occur as a result of the improvement of wildlife and aquatic species habitat. Further, public health and safety would benefit from barrier removal.

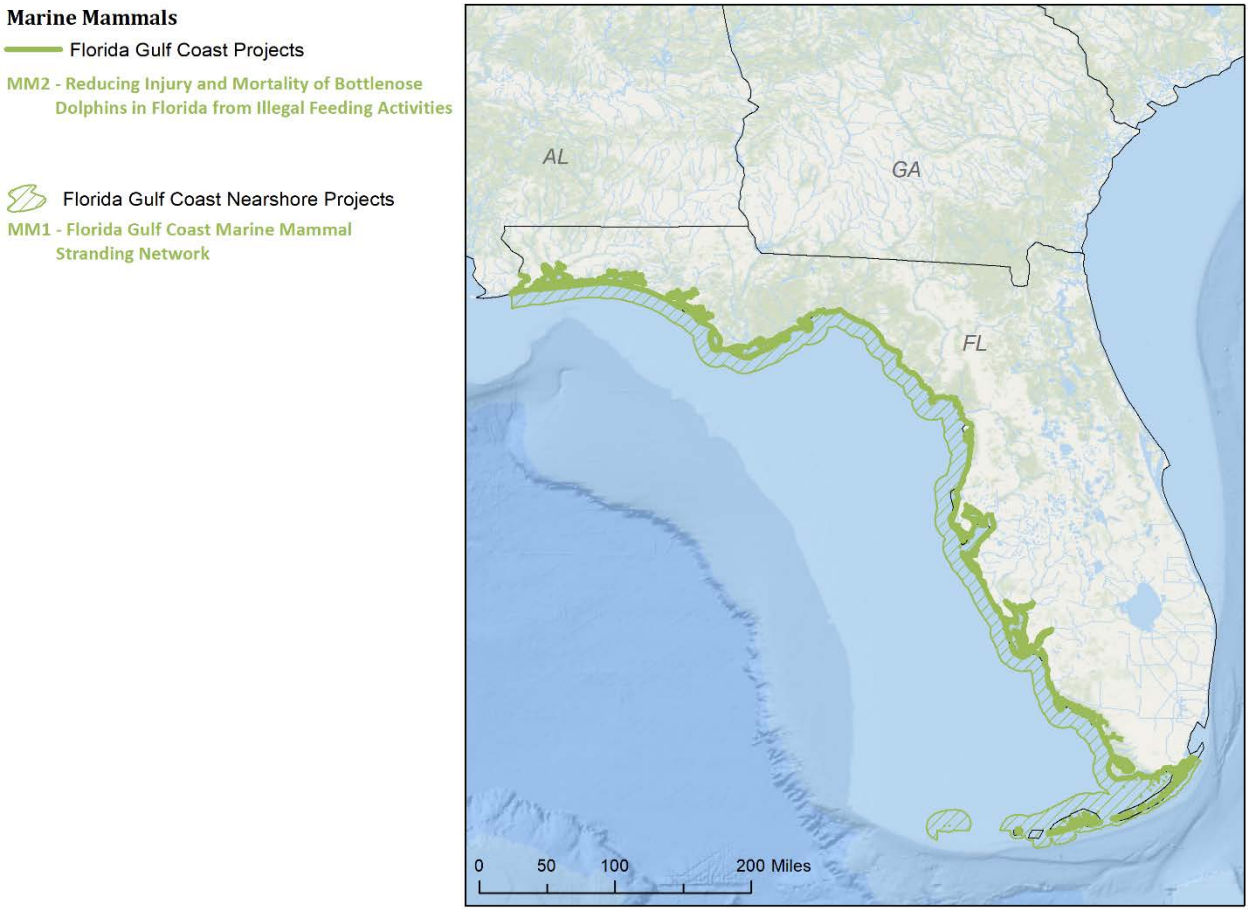
In summary, minor to moderate short- and long-term adverse impacts to socioeconomic resources could occur, depending on the particular barriers removed as part of this project. Short- and long-term benefits to socioeconomic resources are also are anticipated as a result of this project.

4.6.5 No Action

Under the No Action alternative, the sea turtle restoration alternatives proposed in this RP/EA would not occur. Potential short-term and temporary adverse impacts to physical, biological, and socioeconomic resources associated with gathering observational data on existing fishing activities, responding to hooked sea turtles, removing marine debris, conducting surveys, and evaluating information to reduce vessel strikes, and removing physical shoreline barriers on nesting beaches would not occur. If the projects are not implemented, minor to moderate adverse impacts to sea turtles are anticipated including incidental hooking from fishing gear, entrapment and entanglement by marine debris, vessel strikes, and reduced nesting success due to physical barriers on nesting beaches. In summary, under the No Action alternative, no short-term and temporary adverse impacts would occur, but also no long-term benefits to sea turtles would be realized.

4.7 Marine Mammals

Figure 4-3 Marine Mammals project locations



The two projects under the Marine Mammals Restoration Type include activities which would occur across Florida's Gulf Coast (Figure 4-3):

- **MM1, Florida Gulf Coast Marine Mammal Stranding Network (preferred).**
- **MM2, Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities.**

Note that MM2, Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities includes only data-gathering or educational activities, and as such, is covered in Section 4.2.2 and not analyzed further below.

4.7.1 MM1, Florida Gulf Coast Marine Mammal Stranding Network (Preferred)

The project would enhance the MMSN's capabilities to identify, characterize, and quantify marine mammal (specifically cetacean) morbidity and mortality factors and provide conservation managers critical and timely information needed to inform effective actions and plans aimed at mitigating or eliminating threats to marine mammal species. Specifically, the activities most relevant to assessment of the environmental consequences of this project include:

- Providing support for personnel, equipment, stranding, training, or other project-related travel, vehicle fuel, and maintenance of vehicles/vessels/trailers to federally permitted Gulf MMSN organizations to rapidly respond to live and dead stranded marine mammals on the Florida Gulf Coast;
- Maintaining response time to live or dead stranded marine mammals;
- Maintaining MMSN's capacity to respond to unusual natural or anthropogenic events (e.g., oil spills, harmful algal blooms, freshwater events, hurricanes); and,
- Maintaining MMSN's capacity to perform necropsies to understand marine mammal health and threats to support effective conservation management of marine mammals across the region.

4.7.1.1 Resources Analyzed in Detail for this Alternative

Table 4-10 identifies how potentially affected resources are analyzed for this alternative.

Table 4-10 NEPA Assessment of Resources for MM1

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.7.1.3
Hydrology and Water Quality	Analyzed in Section 4.7.1.3
Biological Resources	
Habitats	Analyzed in Section 4.7.1.3
Wildlife Species (including birds)	Analyzed in Section 4.7.1.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.7.1.3
Protected Species	Analyzed in Section 4.7.1.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.7.1.3
Aesthetics and Visual Resources	Analyzed in Section 4.7.1.3
Public Health and Safety	Analyzed in Section 4.7.1.3
Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.7.1.2 Affected Environment

Proposed project activities would occur across the Florida Gulf Coast. A description of the physical, biological, and socioeconomic resources is provided in Section 4.6.2.2. Federally listed species in the project area, as identified through USFWS IPaC, are listed in Appendix E (USFWS 2018).

4.7.1.3 Environmental Consequences

The NMFS provides NEPA analysis of MMSN activities in their Programmatic Environmental Impact Statement for the Marine Mammal Health and Stranding Response Program (hereafter referred to the MMSN PEIS; NMFS 2009). Additionally, the AL TIG and LA TIG each analyzed a MMSN enhancement project for their respective states (AL TIG 2018; LA TIG 2020). The AL TIG RP2/EA, LA TIG RP5/EA, MMSN PEIS, and analysis from the PDARP/PEIS are incorporated by reference herein.

Physical Resources

Project implementation would include MMSN organizations responding to stranded or out-of-habitat marine mammals along the Florida Gulf Coast. Mobilizing equipment, responding to live or dead marine mammals, burying carcasses, and administering medication or other triage may result in short-term, minor adverse impacts to physical resources including geology and substrates and hydrology and water quality in coastal and nearshore habitats (DWH Trustees 2016a; NOAA 2009). Adverse impacts would be temporary in nature, would result from increased human foot traffic during response, carcass burial, vessel or vehicle use, and would return to baseline once response activities are complete.

Increased vessel/vehicle use or foot traffic may increase the potential for temporary localized erosion during response activities. This erosion may increase localized turbidity in nearshore marine or estuarine waters. Additionally, vessels and vehicles could leak contaminants into nearshore waters during response activities. MMSN organizations may bury marine mammal carcasses on-site when not

euthanized using chemical methods, which would require minor digging in nearshore and coastal sediments. Carcasses may contain environmental contaminants that can re-release into the water during decomposition. For this reason, any marine mammals euthanized using chemical injection would not be buried on-site (NOAA 2009).

In summary, this project would result in short-term, minor adverse impacts to physical resources.

Biological Resources

Consistent with the MMSN PEIS and the PDARP/PEIS, project activities would result in localized, short-term, minor adverse impacts to coastal habitats (DWH Trustees 2016a; NMFS 2009). Vessel/ vehicle presence and foot traffic associated with responding to a stranded marine mammal may disturb coastal habitats including beaches and dunes, intertidal marshes, coral reefs, or other habitats where strandings occur. This may include temporary disturbance to sensitive vegetated habitat including vegetated dunes, SAV, and mangroves. However, disturbances would be minor, would only occur during response activities, and would return to baseline conditions once vessels, vehicles, and responders have left the area. Additionally, MMSN responders would take extra precaution to avoid SAV, corals, mangroves, or other sensitive habitats to mitigate adverse impacts. Federally designated EFH for shrimp, red drum, coastal migratory pelagics , and reef fish (NOAA 2018) within these habitats may also experience short-term, minor localized adverse impacts that would be ameliorated once response activities are complete.

Marine and terrestrial species would experience localized, short-term minor adverse impacts related to response activities, which is consistent with findings from the MMSN PEIS and the PDARP/PEIS (DWH Trustees 2016a; NMFS 2009). Highly mobile species including birds, terrestrial mammals, reptiles, amphibians, and fish would be disturbed by increased human, vessel, and/or vehicle presence during response activities. However, these species are able to temporarily leave the area and can return once response activities are complete. Sessile benthic species such as benthic invertebrates may experience moderate adverse impacts as they are unable to leave areas where response activities may occur. However, these impacts would be temporary upon completion of response activities.

ESA-listed species that inhabit nearshore and coastal habitats where strandings occur (such as Gulf sturgeon, smalltooth sawfish, and sea turtles) may experience temporary displacement related to response activities. In 2016, NMFS issued a biological and conference opinion concluding that MMSN activities was likely to adversely affect but would not jeopardize the continued existence of non-targeted species that may be incidentally taken (specifically, green, hawksbill, Kemp's ridley, loggerhead, and leatherback sea turtles, smalltooth sawfish, and Gulf sturgeon; NMFS 2016a). Additionally, this project would have minimal adverse impact on designated critical habitat within Florida's nearshore and coastal habitats since project activities would result in temporary adverse impacts to habitat and would not alter the primary constituent elements of each critical habitat (AL TIG 2018). Based on these determinations and consistent with the MMSN PEIS and the PDARP/PEIS, this project would have minor to moderate short- and long-term adverse impacts on protected species (DWH Trustees 2016a; NMFS 2009). The FL TIG has completed technical assistance with relevant regulatory agencies regarding potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status.

Marine mammals (specifically cetaceans) would experience minor short-term negative impacts associated with increased stress from response activities. However, these short-term stressors would be

balanced with long-term benefits of reducing an animal's pain and suffering and rehabilitating and returning an animal to the wild where it can reproduce and contribute to its species' success.

In summary, this project would result in temporary, short- to long-term, minor to moderate adverse impacts to biological resources and long-term benefits to marine mammals.

Socioeconomic Resources

Section 4.6 of the MMSN PEIS and Section 6.4.9.3.3 of the PDARP/PEIS describe impacts to socioeconomic resources from MMSN activities and are incorporated by reference. To the extent that stranding response occurs around popular coastal recreational sites and causes disruptions to visitors, project activities could result in short-term, negligible to minor adverse effects to tourism and recreational use, aesthetics and visual resources, and public health and safety. In particular, responding to stranded or out-of-habitat marine mammals may temporarily increase localized human, vehicular, or vessel traffic in recreation areas frequented by recreational boaters or beachgoers (DWH Trustees 2016a). Responders may also need to temporarily restrict public access around stranded marine mammals to increase public health and safety. Marine mammal carcasses may also create temporary visually unappealing consequences for recreators (NMFS 2009). However, these minor adverse impacts would be short-term, only lasting for the duration of the response activities.

The project may also result in long-term minor socioeconomic benefits associated with employment as part of response teams in partner MMSN organizations. MMSN organizations are often small not-for-profit organizations that rely on government funding to remain fully functional. Support provided through this project could increase job opportunities for small MMSN organizations (DWH Trustees 2016a).

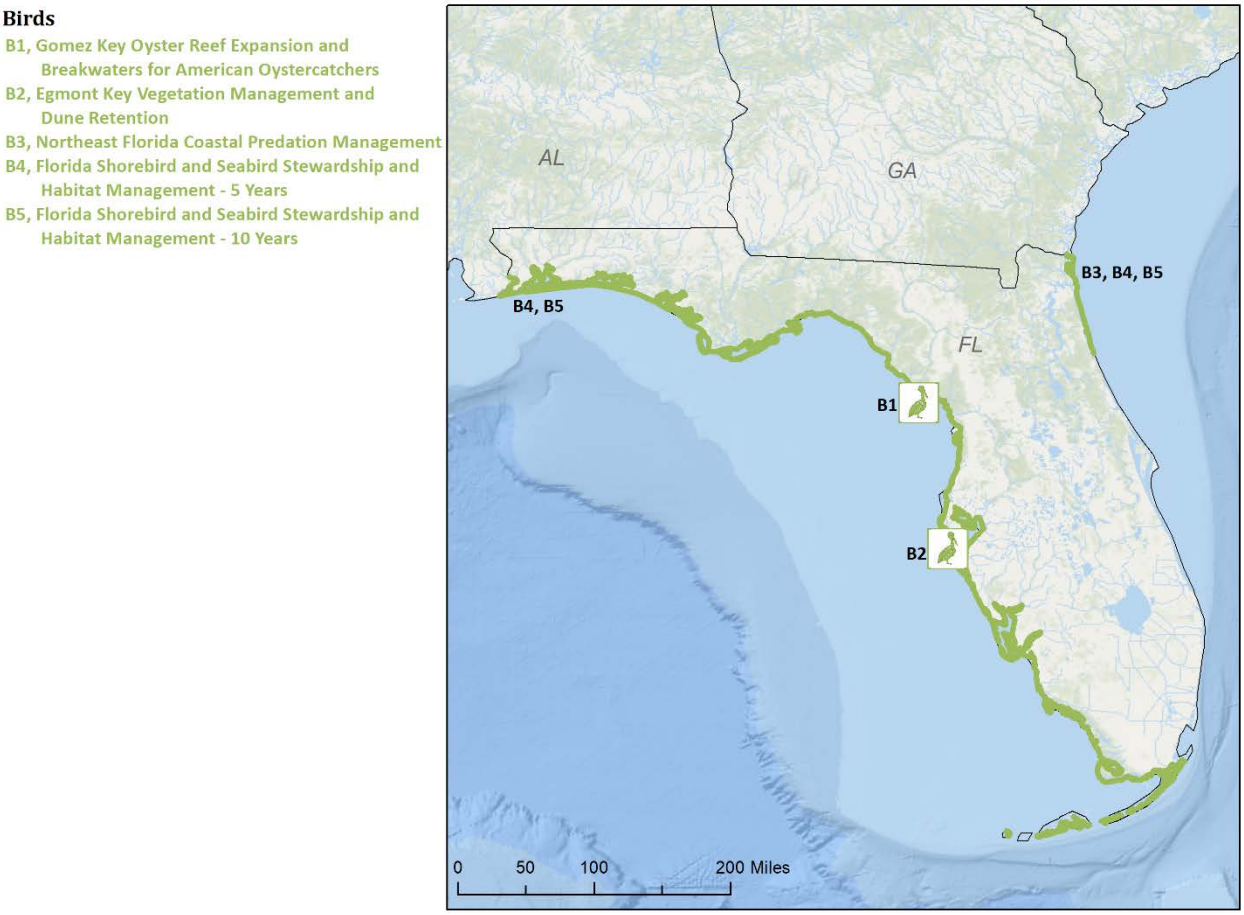
In summary, this project is anticipated to result in periodic short-term, minor adverse effects to socioeconomic resources as a result of stranding activities in popular recreational areas. However, this project could provide long-term, socioeconomic benefits through localized job creation.

4.7.2 No Action

Under the No Action alternative, the marine mammal restoration alternatives proposed in this RP/EA would not occur. Potential short-term and temporary adverse impacts to physical, biological, and socioeconomic resources associated with responding to stranded or out-of-habitat marine mammals would not occur. If the project is not implemented, minor to moderate adverse impacts to marine mammals are anticipated, including increased mortality from stranding events. In summary, under the No Action alternative, no short-term and temporary adverse impacts would occur, but also no long-term benefits would be realized.

4.8 Birds

Figure 4-4 Birds project locations



The five projects under the Birds Restoration Type are located across both the east and west coasts of Florida (Figure 4-4):

- **B1, Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers B2, (preferred)**.
- **B2, Egmont Key Vegetation Management and Dune Retention (preferred)**.
- **B3, Northeast Florida Coastal Predation Management (preferred)**.
- **B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years (preferred)**.
- **B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years**.

Note that both B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years (preferred) and B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years are addressed in Section 4.8.4.

4.8.1 B1, Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers (Preferred)

The goal of the project is to restore and enhance American oystercatcher nesting and foraging habitat at Gomez Key and to prevent further erosion and habitat loss. Activities most relevant to assessment of the environmental consequences for this project include:

- Providing a durable structure and surface area through cultch placement (approximately 2-5 acres, including the breakwater below) for oyster reef expansion and recolonization in the intertidal zone and to expand potential American oystercatcher nesting habitat above the MHW line; and
- Installing native rock (e.g., limestone, shell) breakwaters (approximately 820-1,805 linear feet) along the wave-ward side of the island to dissipate wave energy and increase sediment deposition on the island.

4.8.1.1 Resources Analyzed in Detail for this Alternative

Table 4-11 identifies how potentially affected resources are analyzed for this alternative.

Table 4-11 NEPA Assessment of Resources for B1

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.8.1.3
Hydrology and Water Quality	Analyzed in Section 4.8.1.3
Biological Resources	
Habitats	Analyzed in Section 4.8.1.3
Wildlife Species (including birds)	Analyzed in Section 4.8.1.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.8.1.3
Protected Species	Analyzed in Section 4.8.1.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.8.1.3
Aesthetics and Visual Resources	Analyzed in Section 4.8.1.3
Public Health and Safety	Analyzed in Section 4.8.1.3
Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.8.1.2 Affected Environment

This project would occur in the intertidal zone of Gomez Key. Gomez Key is a small (approximately 2 acres), undeveloped island located in the Cedar Key area of Florida's Big Bend region on the Gulf Coast of Florida. Gomez Key sits in-between the Suwannee Sound and Waccasassa Bay and is considered to be part of the larger Suwannee River Watershed.

Physical Resources

Gomez Key is an undisturbed sand/shell island. The island includes a sandy beach shoreline on the east and upland habitats throughout. Waters around Gomez Key are naturally shallow (at times only 1 foot deep), but natural channels as deep as 15 feet intersect the broader Cedar Key area. Gomez Key is tidally influenced, with an average diurnal range of 3.8 feet. Waters surrounding Gomez Key are listed as a Clean Water Act (CWA; 33 U.S.C §§ 1251-1378) Section 303d impaired waterbody for fecal coliform (FDEP 2020d).

Biological Resources

Various marine habitats surround Gomez Key, including estuarine and marine wetlands. Red mangroves (*Rhizophora mangle*) or habitat likely to support red mangroves are present within the tidal estuarine areas of Gomez Key. Total mangrove area may cover up to 60,000 square feet and 1,216 linear feet of shoreline but is likely less (area estimated using Google Earth and NWI data). SAV or habitat likely to support SAV is also present in the in-water project areas around Gomez Key. SAV in this location are categorized as patchy (discontinuous), with an estimated percent cover of 10-50 percent (FWC 2018). Live oyster beds have been documented at Gomez Key and are present throughout the Cedar Key area (FWC 2019b).

The uplands portion of Gomez Key are undeveloped, emergent herbaceous wetlands dominated by woody, scrub-shrub vegetation with persistent broad-leaved evergreens such as red mangrove (USGS 2016). Uplands at Gomez Key are subject to tidal flooding and exposure and are frequently over-washed and overtopped during the normal tidal cycle.

Gomez Key supports a range of wildlife. The island serves as an important nesting and foraging location for American oystercatchers. Other bird species, including red knot and wood stork (*Mycteria americana*) also likely utilize the island. Protected species such as the gopher tortoise (*Gopherus polyphemus*), Florida salt marsh vole (*Microtus pennsylvanicus dukecampbelli*), Eastern black rail (*Laterallus jamaicensis*), and Eastern indigo snake (*Drymarchon couperi*) may also occur on the island. A wide range of wildlife also occur in the marine environment surrounding Gomez Key. The Waccasassa Bay/Withlacoochee Bay/Crystal Bay Stock and the Gulf of Mexico Eastern Coastal Stock of bottlenose dolphins could be present within the project area (Hayes et al. 2020). West Indian manatee could also be present in the project area. Designated EFH for coastal migratory pelagics, red drum, reef fish, and shrimp overlaps with the project area (NOAA 2018). Finally, sea turtles, Gulf sturgeon, and smalltooth sawfish may also occur in the project area. The current federal species list, as identified through IPaC, is summarized in Appendix E (USFWS 2018).

Socioeconomic Resources

As noted above, Gomez Key is a small, undisturbed island. The island does not have any existing infrastructure. However, the general Cedar Key area is a popular recreational area for fishing and boating. The wildlife resources on the island provide economic value, contributing to commercially and recreationally valuable fisheries, wildlife viewing, and tourism.

4.8.1.3 Environmental Consequences

Extensive work on oysters in the area indicates that oyster larvae are present in the system and the limiting factor for oyster resettlement is the presence of hard substrate. Past projects in the area,

including the NFWF-GEBF Recovery and Resilience of Oyster Reefs in the Big Bend of Florida project, have been successful at reestablishing oysters.

Physical Resources

The placement of cultch and installation of native rock breakwaters would require the use of a barge and excavators to deposit limestone rip rap and small skiffs to deposit cultch material in the intertidal zone which are anticipated to disturb soils and sediments in the area. Approximately 845-1,690 cubic yards of limestone rip rap with cultch are expected to be deposited in the intertidal zone as part of this project and would displace any existing soft-bottom habitat. These implementation activities are also likely to increase turbidity in the area during construction, which result in short-term, minor adverse impacts on hydrology and water quality. In-water construction BMPs would be implemented to localize and ameliorate these impacts (DWH Trustees 2016a).

The project would result in long-term benefits to geology and substrates through the expansion of reef habitat. Increased oyster abundance and filter feeding removes sediment and nutrients from the water column, which improves water quality. Further, the native rock (e.g., limestone, shell) breakwaters (approximately 820-1,805 linear feet) would be installed along the wave-ward side of the island and would dissipate wave energy and increase sediment deposition on the island.

In summary this project is anticipated to result in minor, short-term adverse impacts and long-term benefits to physical resources.

Biological Resources

The use of a barge and excavators and placement of cultch or breakwaters may result in short-term, minor adverse impacts to marine habitats, terrestrial wildlife, and marine and estuarine fauna. The reef expansion may also cause short-term, minor loss or displacement of benthic organisms, including oysters. Project permitting would include oyster mapping to develop BMPs for reducing adverse impacts to oysters during implementation. Physical disturbance, noise, and increased turbidity during construction are also likely to negatively impact wildlife or marine and estuarine fauna in the area. However, these impacts would be temporary, and fauna are likely to avoid the area during construction activities. Further, any interactions with, or sightings of stranded, entangled, injured, or dead sea turtles, Gulf sturgeon, sawfish, or marine mammals would be immediately reported to the appropriate regulatory agency. Breakwaters would include gaps to allow for species movement and reduce the risk of entrapment.

The FL TIG has completed technical assistance with relevant regulatory agencies related to potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status. Conservation measures recommended during consultation would be incorporated into final project design and implementation to avoid and/or minimize adverse impacts to protected species and critical habitats. Specific conservation measures would also be implemented during construction to avoid and minimize disruption and overall adverse impacts to protected species. Below is a list of potential protected species at the project site, effects from the project activities, and potential conservation measures.

Sea turtles: Sea turtles have been observed swimming or feeding on seagrasses within the Cedar Key area. Sea turtle nesting does not occur on Gomez Key where project activities would occur. There is potential for sea turtle encounters during construction; however, with the implementation of BMPs

(such as designing gaps in the breakwater), the proposed project may have short-term, minor adverse effects to sea turtles.

West Indian manatee and marine mammals: The West Indian manatee inhabits freshwater, brackish, and marine environments. It typically occurs in coastal and inland tidal rivers and streams, mangrove swamps, salt marshes, freshwater springs, canals, lagoons, and vegetated bottoms. It moves to warm-water sites, including industrial warm-water discharges, during the winter. The project location does not intersect with any identified critical habitat for the West Indian manatee, but manatees could potentially be present in the project area. Additionally, the Waccasassa Bay/Withlacoochee Bay/Crystal Bay Stock and the Gulf of Mexico Eastern Coastal Stock of bottlenose dolphins could be present within the project area. Marine mammals are affected by vibrations and noise resulting from construction activities. This project requires in-water work for the installation of a native rock breakwater and reef material deployment. If required during environmental compliance review, BMPs such as those described in the USFWS Standard Manatee Construction Conditions for In-water Work (2011), would be implemented. As a result of construction-related activities from these improvements, this project may have minor short-term adverse effects on the West Indian manatee and other marine mammals.

Gulf sturgeon and smalltooth sawfish: These species may be affected by the part of this project that occurs in the intertidal zone of Gomez Key. However, because 1) construction activities would occur in relatively shallow water (less than 6 feet deep) and close to shore (within approximately 30 feet), 2) Gulf sturgeon and smalltooth sawfish could avoid any disturbances in that area by swimming away, 3) any increase in turbidity caused by in-water project work would be relatively low compared to the naturally high levels caused by wave actions in this area, and 4) all the required BMPs would be employed during the project, this project may have short-term, minor adverse impacts on Gulf sturgeon or smalltooth sawfish.

Eastern black rail: This species requires dense vegetation in wetland habitats and have been documented in the Cedar Key area. Construction could occur in months where this species could be present, and these activities could generate noise and overall human disturbance to resting and foraging birds. Based on the short duration of construction activities, this project may have short-term minor adverse effects on this species.

Red knot: This bird prefers open coastal areas including sandy beaches and tidal flats. They prefer areas along the shoreline, including mudflats. As such, they may be present around the action area, but are unlikely to be foraging in the action area. If construction occurs during the summer months (approximately May to August), the species is not generally present along the Florida Gulf Coast. However, construction may need to occur in other months which could generate construction noise and disturbance to resting and foraging birds. Red knots are unlikely to occur in the area, but may occur in low numbers; as such, this project may have short-term minor adverse impacts to this species.

Wood stork: The wood stork prefers to nest and forage in cypress swamps and marshes. While the wood stork is not known to inhabit the project site, it could rest and forage in swamp or wooded areas at or nearby project locations. Because this species is highly mobile, any construction activities that may disturb this species would result in the wood stork leaving the area. As such, this project may have short-term minor adverse impacts on the wood stork.

This project would also result in long-term benefits for wildlife and habitat on Gomez Key. Habitat loss in the intertidal waters in the project area is the primary threat facing the breeding population of American oystercatchers in the southern half of the Big Bend region of Florida's Gulf Coast (from the Apalachicola River to just north of Tampa Bay, including Gomez Key). Many small, but critically important, nesting sites are already threatened by overwash and erosion during the normal tidal cycle. This project would support and expand the nesting population of American oystercatchers in the Southern Big Bend by providing additional surface area for reef expansion and recolonization and expanding potential nesting habitat. Oyster cultch placement placed in this oyster spawning area would provide a substrate for oyster larvae to attach and grow, providing a long-term benefit to oysters. Oyster recruitment would likely naturally follow the placement of rock materials due to high spat abundance in the area. The reef may also provide foraging and shelter areas for other species such as fish and invertebrates.

In summary, this project is anticipated to result in short-term, minor adverse impacts on biological resources, and long-term benefits.

Socioeconomic Resources

Implementation of this project could negatively impact visitation and recreation in the area during construction since boaters would have to avoid the project area, but these impacts would be temporary and localized. Although no adverse impacts to vessel traffic is anticipated, project implementation would follow all applicable guidelines regarding reef depth profiles, overhead clearance, and clear marking for vessels.

This project is anticipated to result in long-term benefits because the expanded reef habitat would support a range of marine species and would likely result in improved recreational fishing opportunities. Short-term economic benefits associated with employment and expenditures associated with construction activities would occur, particularly to the extent that local utility companies are utilized.

In summary, this project is anticipated to result in short-term adverse impacts to recreation in the area, but also short- and long-term benefits to socioeconomic resources.

4.8.2 B2, Egmont Key Vegetation Management and Dune Retention (Preferred)

The goal of this project is to protect and restore coastal dune bird nesting habitat by removing invasive coin vine, planting native vegetation, and reducing shoreline (wind and wave) erosion. Activities most relevant to assessment of the environmental consequences for this project include:

- Conduct chemical treatment and mechanical removal of coin vine in areas that were, are, or could potentially be bird-nesting habitat (approximately 12 acres) and re-treat, where necessary, an additional 13 acres; and,
- Restore and protect bird-nesting habitat by planting native vegetation and installing sand fencing to enhance barrier-island habitat, where appropriate.

4.8.2.1 Resources Analyzed in Detail for this Alternative

Table 4-12 identifies how potentially affected resources are analyzed for this alternative.

Table 4-12 NEPA Assessment of Resources for B2

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.8.2.3
Hydrology and Water Quality	Analyzed in Section 4.8.2.3
Biological Resources	
Habitats	Analyzed in Section 4.8.2.3
Wildlife Species (including birds)	Analyzed in Section 4.8.2.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)a	Does not require additional analysis. Project activities would not include any in-water work or disturbance to marine or estuarine fauna.
Protected Species	Analyzed in Section 4.8.2.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.8.2.3
Aesthetics and Visual Resources	Analyzed in Section 4.8.2.3
Public Health and Safety	Analyzed in Section 4.8.2.3
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.8.2.2 Affected Environment

Egmont Key is a largely undeveloped island located outside the mouth of Tampa Bay in the Gulf. Egmont Key is bounded to the north by Egmont Channel and to the south by Southwest Channel. The island contains protected wildlife habitat and is designated as both a national wildlife refuge and state park. Existing structures include visitor contact stations, EKNWR facilities, access docks, and walking paths. As discussed in Section 4.3.2.2 above, a number of historical structures exist on the island, which serve as a tourism attraction. The island is open to the public for day-use but is only accessible by personal boat or passenger ferry. Recreational activities on the island include wildlife viewing and walking, and in the water surrounding the island, boating, swimming, and angling. Portions of the island are designated wildlife sanctuaries and are closed (either permanently or seasonally) to public access. Due to the island's history of human use, natural habitats are highly modified and negatively impacted by invasive plants (USFWS 2010b).

Physical Resources

Egmont Key is nearly 2 miles long and just more than 2,000 feet across at the widest point. The upland portion is on average approximately 5 feet above sea level (USFWS 2010b). Soils are composed of undifferentiated fine sands and shells, and all are classified as St. Augustine Fine Sand (USFWS 2010b). The island is hydrologically connected to the Floridan Aquifer, but it is unknown if this water source is potable. USGS data suggests the area is in an area of zero recharge. The water table is very shallow, ranging from 3-4 feet below land surface (Fernandez 1996), and seasonally reaches a depth of 20-30 inches.

The island is surrounded by submerged soft bottom sediments and estuarine/marine waters. The average tidal range is 2.3 feet and tidal currents are typically between 4-6 feet per second during flood

and ebb tides, respectively. Located outside the mouth of Tampa Bay, there is freshwater influence; however, salinities are predominantly marine (25-38 parts per thousand). Wind, wind-driven waves, and tidal currents are significant drivers of the island's physical features.

Additional information about the island's geology and substrates can be found in the EKNWR Comprehensive Conservation Plan (USFWS 2010b).

Biological Resources

Egmont Key's terrestrial environment provides habitat for a diversity of rare and valuable fauna.

Freshwater forested and shrub wetlands are present on the upland portion of the island. Sea oat (*Uniola paniculata*), Australian pine (*Casuarina equisetifolia*), cabbage palm (*Sabal palmetto*), and Brazilian pepper (*Schinus terebinthifolius*) are the dominant upland plants (Dodd 1998). Strangler fig (*Ficus aurea*), poison ivy (*Toxicodendron radicans*), Spanish stopper (*Eugenia foetida*), saw palmetto (*Serenoa repens*), sea grape (*Coccoloba uvifera*), Florida privet (*Forestiera segregate*), sand spur (*Cenchrus incertus*), railroad vine (*Ipomoea pes-caprae*), hairy beach sunflower (*Helianthus debilis subsp. vestitus*), tall threeawn grass (*Aristida rhizomophora swallen*), muhly grass (*Muhlenbergia capillaris*), beach panicum (*Panicum amarum*), seaside gentian (*Eustoma exultatum*), and southern red cedars (*Juniperus silicicola*) also occur (USFWS 2010b). As described by USFWS (2010), invasive plant species pose a significant threat, causing habitat loss on Egmont Key. Coin vine in particular spreads rapidly, displaces native plants, and reduces nesting and foraging habitat for birds. The current coin vine infestation ranges from 40-100 percent cover on approximately 25 acres of the eastern shoreline of the island, forming dense, impenetrable thickets that shade out desirable nesting areas, degrading bird-nesting and foraging habitat.

Gopher tortoises burrow in the island's coastal berms. Shorebirds such as brown pelican, terns, black skimmers, American oystercatchers, plovers and sandpipers also utilize the sandy beach habitat. According to USFWS (2010), more than 100 species of bird have been recorded on Egmont, with 38,000 nesting pairs in 1 year. A number of nesting waterbirds, shorebirds, transient, and wintering shorebird species in the Tampa Bay region utilize Egmont Key, including black skimmers, royal (*Thalasseus maximus*) and sandwich (*Thalasseus sandvicensis*) terns, piping plovers, snowy plovers, American oystercatchers, and white ibis (*Eudocimus albus*). Upland areas are designated critical habitat for piping plover.

The current federal species list, as identified through IPaC, is summarized in Appendix E (USFWS 2018). Further information about the island's biological resources can be found in the EKNWR Comprehensive Conservation Plan (USFWS 2010b).

Socioeconomic Resources

The Tampa Bay region is an economically important center for shipping, business, and industry, including manufacturing, and tourism; however, Tampa is not as dependent on tourism as other major cities in Florida (USFWS 2010b). The wildlife resources of Egmont Key themselves provide economic value, contributing to commercially and recreationally valuable fisheries, wildlife viewing, and tourism. In addition to recreational opportunities, Egmont Key provides employment opportunities in the local community.

4.8.2.3 Environmental Consequences

The USFWS currently manages invasive species on Egmont Key. Current refuge management strategies align with the activities proposed in this project, including a combination of chemical treatment (and re-treatment, if necessary), mechanical removal, burning of dead plant material, planting native vegetation, and implementing sand-entrapment techniques, as appropriate. NEPA compliance for invasive plant removal typically involves the DOI NPS CE E.6., "Restoration of noncontroversial native species into suitable habitats within their historic range and elimination of exotic [invasive] species." Further, installation of fencing is also covered by DOI USFWS CE B.2.a.

Physical Resources

Upland soils and the adjacent marine environment are likely to be disturbed during chemical applications, mechanical removal, and burning to treat and remove invasive plant material from the island. Increased foot traffic and the potential use of equipment for mechanical removals and burning would disturb substrates and water quality in the short-term. However, BMPs would be implemented to minimize adverse impacts. Herbicide application activities are covered under an existing USFWS ESA Section 7 consultation.

Sand fencing and signage would be installed using a post-hole digger to manually dig 2-3-foot-deep holes for pressure-treated pine posts. Sand fences would be assembled by attaching 16-gauge stainless steel with 1.5-inch staples using a gas-powered compressor. All materials would be transported to the island by boat and moved to the project site by all-terrain vehicle/utility vehicle using existing trails. Minor adverse impacts to soils are expected during installation of sand fencing; however, these activities would be short-term and localized.

Removal of invasive plants would result in long-term benefits to the island's physical resources. Long-term benefits are also expected following installing sand fencing and planting native vegetation, both of which would facilitate passive trapping of sand for long-term reduction of wind and wave erosion. Reduced soil erosion would have additional long-term benefits to water quality.

In summary, this project is anticipated to result in short-term, minor, localized adverse impacts and long-term benefits to physical resources.

Biological Resources

Proposed project activities could have short-term, minor adverse impacts on terrestrial wildlife and habitats through physical disturbance during fieldwork or chemical intoxication during invasive species treatments. Adverse impacts would be temporary and would occur in relatively small areas. Herbicide use would follow all permit protocols and BMPs to ensure proper and approved chemicals are used, that they are used in the appropriate concentration and amount, and that their application hits target species as precisely as possible with minimal drift onto non-target species. If more than one pesticide is available for use and all have the same efficacy, the one with the shorter half-life would be used to keep all species as safe as possible. Although there is a window of time in which herbicides can be applied, application would occur as much as possible when nesting populations are lowest and least vulnerable and to minimize effects to migratory bird populations. Adverse impacts to ESA-listed species under USFWS purview from herbicide application have been previously evaluated for treatment of coin vine on protected species and critical habitat (USFWS 2019). Herbicide use would follow all existing USFWS ESA

consultation guidelines to ensure proper use and minimal adverse impacts to protected species, including treating coin vine outside of bird and sea turtle nesting seasons.

Sand fence installation could negatively impact wildlife and vegetation during implementation due to trampling, human activity, and noise. Sand fencing would be designed for sea turtle compatibility and would be made of biodegradable material. As built, fencing would be installed in 10-foot sections spaced 15 feet apart in the back-dune area above MHW. Each section would be installed at a 45-degree angle, completely open in the front, to allow movement and avoid entrapment of turtles and other wildlife.

Installation of sand fencing would occur approximately September through February to reduce adverse impacts to nesting birds and sea turtles. This work window does coincide with piping plover and red knot wintering seasons in Florida. To mitigate any potential negative impacts, shorebird surveys would be conducted within the project area and a buffer zone. If piping plovers and red knots are present within the buffer, installation would stop until the birds move away from the area of their own volition. Similar BMPs would be employed for gopher tortoises and Eastern indigo snakes. Best practices for birds (bald eagles [*Haliaeetus leucocephalus*], migratory birds, piping plover and red knot), reptiles and amphibians (Eastern indigo snake), tortoises/turtles (gopher tortoise, sea turtles – nesting beaches), invasive species, and general construction measures would be adhered to, where applicable (DWH Trustees 2016a). The FL TIG has completed technical assistance with relevant regulatory agencies regarding potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status.

Coin vine infestation and beach and dune erosion are having a deleterious effect on colonial nesting, wading bird nesting and foraging, and sea turtle nesting habitat on Egmont Key. While coin vine is native to Florida, excessive overgrowth has shaded out desirable nesting area and scrub/shrub vegetation. Additionally, winds and waves are increasing erosion of the beach and dune habitat that remains on the western side of the island. As such, removal of invasive plant species, installation of sand fencing, and planting native vegetation in the project area would generally have long-term, benefits to biological resources.

In summary, this project is anticipated to result in short-term minor adverse impacts and long-term benefits to biological resources.

Socioeconomic Resources

The activities associated with vegetation management have short-term adverse effects on aesthetics and visual resources, which could adversely affect the quality of recreational experiences in affected areas; however, effects on recreational use would be limited to the extent possible by conducting vegetation management activities at times of day or in locations where human presence would be minimal. Additionally, all vegetation removal methods with potential to adversely impact human health and safety would be performed by trained and permitted personnel to reduce risks.

Vegetation management activities would provide long-term benefits to wildlife-related tourism and recreation by restoring natural environments and biodiversity that enhance aesthetics, wildlife viewing, and tourism on Egmont Key.

In summary, this project is anticipated to result in short-term, minor adverse impacts and long-term benefits to socioeconomic resources.

4.8.3 B3, Northeast Florida Coastal Predation Management (Preferred)

The goal of the project is to increase breeding success for state-threatened American oystercatchers, least terns, and black skimmers, as well as Wilson's plovers, a Species of Greatest Conservation Need by implementing predation management measures at critical nesting sites in Nassau, Duval, and St. Johns Counties in Northeast Florida. Activities most relevant to assessment of the environmental consequences for this project include:

- Pre-season predator tracking (using game cameras and individual observation) to determine movement of predator species known to impact nesting colonies;
- Proactive non-lethal predation management, such as perch deterrents/removal, trash management, predator effigies, and electric fence deployment/maintenance; and,
- Targeted lethal predation management (e.g., coyote trapping, crow shooting) where specific predators have been documented to be causing damage to a nest site or nesting colony.

4.8.3.1 Resources Analyzed in Detail for this Alternative

Table 4-13 identifies how potentially affected resources are analyzed for this alternative.

Table 4-13 NEPA Assessment of Resources for B3

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.8.3.3
Hydrology and Water Quality[a]	Does not require additional analysis. Project activities would not include any in-water work or chemicals that could pollute adjacent waters.
Biological Resources	
Habitats	Analyzed in Section 4.8.3.3
Wildlife Species (including birds)	Analyzed in Section 4.8.3.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)[a]	Does not require additional analysis. Project activities would not include any in-water work or disturbance to marine or estuarine fauna.
Protected Species	Analyzed in Section 4.8.3.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.8.3.3
Aesthetics and Visual Resources	Analyzed in Section 4.8.3.3
Public Health and Safety	Analyzed in Section 4.8.3.3
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.8.3.2 Affected Environment

Seabird and shorebird nesting sites in Nassau, Duval, and St. Johns Counties in Northeast Florida primarily occur along undeveloped, non-vegetated sandy beaches on the ocean-facing side of barrier islands. Northeast Florida's barrier island habitats have been largely developed for residential and commercial purposes, except for conservation lands held by public (county, state, and federal

governments) and private entities. Various state parks, aquatic preserves, national monuments, and other conservation areas exist along the Northeast Florida coast to protect undeveloped nearshore habitats and associated wildlife. Additionally, some of these sites also protect historic structures such as Fort Matanzas and Fort Clinch, both of which date back to the late 1700s Spanish colonial era. Northeast Florida's natural environment creates ample outdoor recreational opportunities for residents and visitors interested in fishing, hunting, boating, beach-going, and wildlife viewing.

Physical Resources

Soil and sediment types in Northeast Florida largely depend on localized water flow, wave energy, water currents, and tides. Sediments are primarily from Holocene or Pleistocene (specifically the Anastasia Formation) geologic formation (FDEP 2020c). Beaches and dunes and adjacent habitats are primarily composed of unconsolidated fine sands and silts or shelly sands and clay. Over 25 different types of soils and sediments are found at the various bird nesting sites in Northeast Florida; soils and sediments that comprise greater than 5 percent of the project area include very frequently flooded beaches, rarely flooded Fripp-Corolla complex, rarely flooded Newhan-Corolla complex, beaches, and Fripp-Satellite complex (USDA-NRCS 2020). As is typical of unconsolidated beach and dune sediments, beaches and dunes along Northeast Florida are subject to erosion from wind, waves, and development or other human disturbance. Eleven critically eroding areas (beaches and inlets) exist across the three counties for a total of 37.6 miles of critically eroding shoreline (FDEP 2020a).

Biological Resources

The Florida Natural Area Inventory's (FNAI) Guide to the Natural Communities of Florida (2010) provides descriptions of coastal habitats and their associated wildlife and is incorporated by reference. The Northeast Florida coastline can contain multiple lines of dunes separated by interdunal swales. Dune width generally increases with less development and erosion, and naturally wide dunes and beaches can transition into successional habitat types such as coastal grasslands, coastal strand, and maritime hammock.

Nesting shorebirds and seabirds primarily inhabit unvegetated beaches and dunes along the Northeast Florida coast. Foredune habitat is characterized by specialist plants able to withstand a low nutrient, harsh conditions (high wind and wave energy) environment, which includes sea oats, sand cordgrass (*Spartina bakeri*), and railroad vine. Within Northeast Florida, primary dune height averages approximately 15 feet, ranging from 5-40 feet (St. Johns County 2003).

Coastal grasslands are positioned behind the immediate beach and dune coastline. This community is characterized as an herbaceous transitional zone between beach and dune habitats and wooded coastal strand and maritime hammock habitats. Coastal grassland vegetation includes sea oats, beach panicum, and saltmeadow cordgrass (*Spartina patens*) as well as camphorweed (*Heterotheca subaxillaris*) and earleaf greenbrier (*Smilax auriculate*) on more stable soils (FNAI 2010). Inland from coastal grassland is coastal strand habitat, which is characterized by stabilized coastal dune that is thickly vegetated by evergreen shrubs. Northeast Florida coastal strand contains more temperate vegetation including saw palmetto, dwarfed cabbage palm, red cedar, and live oak (*Quercus virginiana*; FNAI 2010). Coastal strand is largely intact within publicly owned (e.g., Guana Tolomato Matanzas National Estuarine Research Reserve) or undeveloped areas along the Northeast Florida coast. Upland of coastal strand, maritime hammock communities form characterized by a closed canopy evergreen hardwood forest with an understory layer. Along the Northeast Florida coast, maritime hammock is composed of live oak,

red bay, and cabbage palm canopy while red cedar, American holly (*Ilex opaca*), tough bully (*Sideroxylon tenax*), and saw palmetto compose the understory layer.

Northeast Florida's coastal habitats are home to a variety of mammals, reptiles, invertebrates, and birds. Common mammals include raccoons, eastern cottontail rabbits, skunks, river otters, coyotes, marsh rabbits, beach mice, and white-tailed deer (*Odocoileus virginianus*). Raccoons and coyotes can become a nuisance near heavily populated areas as they seek out accumulated trash. Feral cats and stray dogs are common around heavily populated areas and are a particular management concern for transmitting diseases to native species (FDEP 2009).

Common reptiles found in Northeast Florida coastal habitats include the spotted turtle (*Clemmys guttata*), coachwhip snakes (*Masticophis sp.*), rat snakes, and eastern diamondback rattlesnake (*Crotalus adamanteus*). Federally protected gopher tortoises and Eastern indigo snakes are also known to occur in Northeast Florida. Loggerhead, green, leatherback, and Kemp's ridley sea turtles nest on sandy beaches from May to October (FWC 2019c). Also present on sandy beaches are marine invertebrates such as ghost (*Ocypode quadrata*), blue (*Callinectes sapidus*), fiddler (*Uca sp.*), and horseshoe (*Limulus polyphemus*) crabs.

Northeast Florida's coastal habitats are home to a variety of resident, migratory, and wintering birds. Large seabird and shorebird colonies often inhabit Northeast Florida beaches and dunes from March to September. State-designated Critical Wildlife Areas have been established to protect these colonies by reducing human disturbance. Common bird species include blackbirds, sparrows, herons, egrets, plovers, sandpipers, terns, and gulls. A number of state- and federally-protected birds such as piping plover, red knot, American oystercatchers, and Wilson's plover are found in Northeast Florida.

Federal and state listed species in the project area, as identified through USFWS IPaC, are listed in Appendix E (USFWS 2018).

Socioeconomic Resources

According to July 2019 population estimates, Duval County had the largest population followed by St. Johns and Nassau Counties. Together, the three counties in this project area account for approximately 6 percent of the total Florida population (U.S. Census Bureau 2019). Nassau and St. Johns Counties have population growth higher than the state average, although all three counties are experiencing population growth. St. Johns County has the longest coastline (42 miles) of the three Northeast Florida counties (St. Johns County 2003). Residential properties comprise the bulk of oceanfront development (more than 90 percent in St. Johns County) but various conservation inholdings are owned and managed by local, state, and federal government and private entities (St. Johns County 2003).

Tourism and recreational use in Nassau, Duval, and St. Johns Counties is highly dependent on healthy coastal ecosystems. Visitors and residents participate in a variety of nature-based recreation, including fishing, beach-going, swimming, boating, hunting, wildlife viewing, and, most notably for Northeast Florida, beach driving. Additionally, Northeast Florida contains numerous prehistoric and historic structures that are subject to tourism and recreation including the City of St. Augustine, Fort Matanzas, and Native American shell middens. More information regarding cultural resources can be found in Section 4.3.2.2. As is common elsewhere in Florida, tourism and recreation in Nassau, Duval, and St. Johns Counties can have deleterious effects on habitats and wildlife species from human disturbance.

Public entities (e.g., NPS, FDEP) monitor and steward shorebird nesting sites within public parks and would temporarily exclude visitors from nesting areas, if necessary.

4.8.3.3 Environmental Consequences

Restoration activities for this project are expected to primarily affect biological and socioeconomic resources, while adverse impacts on physical resources would be negligible. Lethal and non-lethal predator-control measures are predicted to have beneficial effects on habitats, wildlife species, and protected species due to decreased predation and habitat damage. FWC currently manages seabirds and shorebirds, including nest depredation from predators, through their larger Florida Shorebird Program. FWC and USDA-APHIS-WS maintain migratory bird depredation permits from USFWS for statewide lethal and non-lethal control of avian species. Mammal removal (through lethal and non-lethal methods) would be conducted by FWC and/or USDA-APHIS-WS. Staff would follow protocols and standard permit holder requirements for mammalian removal.

Predator management activities have been previously analyzed by the FL TIG through the Phase II Enhanced Management of Avian Breeding Habitat Injured by Response Activities in the Florida Panhandle, Alabama and Mississippi (Early Restoration Plan II; DWH Trustees 2012) and the RP1/EA St. Vincent National Wildlife Refuge Predator control (FL TIG RP1/EA; FL TIG 2019) projects. Additionally, USDA-APHIS-WS has completed NEPA analysis for similar activities along the Florida Coast in two separate EAs: Environmental Assessment of Mammal Damage Management in Florida and FONSI (hereafter referred to as the USDA EA; USDA-APHIS-WS 2013) and Management of Predation Losses to State and Federally Endangered, Threatened, and Species of Special Concern; and Feral Hog Management to Protect Other State and Federally Endangered, Threatened, Species of Special Concern, and Candidate Species of Fauna and Flora in the State of Florida and FONSI (USDA-APHIS-WS 2003). These resources are incorporated by reference herein.

Physical Resources

This project would result in short-term, minor localized adverse impacts to geology and substrates due to foot traffic and carcass burial. Foot traffic through beaches, dunes, or other coastal habitats while implementing predation management activities could cause minor localized erosion. However, foot traffic would not increase over the level that currently occurs as part of FWC's Shorebird Program implementation, and existing trails or dune crossovers would be utilized to the greatest extent possible. Additionally, conditions would return to baseline once the foot traffic ends.

Predator carcass disposal is dependent upon site characteristics (e.g., visibility/public access to the property, accessibility of remote wooded habitat, subsurface archeological sites that limit digging). Carcasses may be disposed of by remote burial in the woods (at least 2 feet below the surface of the ground and above the water table), remote surface disposal in the woods without burial, or by using 3-millimeter-thick plastic trash bags and disposing of carcasses at a Class I landfill with prior approval from landfill owner/operator. Carcass burial may result in localized erosion, but adverse impacts would return to baseline once project activities are complete. Lethal management would not involve chemical euthanasia that could contaminate soils, sediments, or water from carcass burial.

In summary, this project is anticipated to result in short-term, minor localized adverse impacts to geology and substrates.

Biological Resources

Non-lethal predator management methods (e.g., perch deterrent deployment/removal, trash management, predator effigies, electric fence deployment/maintenance) would result in negligible to minor adverse impacts to targeted predators. Non-lethal methods are intended to exclude or disperse predators by making an area unattractive and would not result in harm or mortality to an individual predator (USDA-APHIS-WS 2013). Conversely, lethal methods would result in short- and long-term moderate adverse impacts to an individual predator and local predator populations. Nuisance individuals identified as causing damage to nest and bird colonies would be targeted for lethal removal, removing that individual from the population. Lethal methods would only be applied when other non-lethal methods are ineffective, would follow American Veterinary Medical Association and American Association of Zoo Veterinarians guidelines on euthanasia (American Association of Zoo Veterinarians 2006; American Veterinary Medical Association 2020), and would be closely monitored to avoid reducing predator populations to an extent that a species would be extirpated (USDA-APHIS-WS 2013).

Consistent with the USDA EA, FL TIG RP1/EA, and Early Restoration Plan II, both non-lethal and lethal predator-control methods could result in short-term, minor adverse impacts to non-predator terrestrial wildlife and protected species (DWH Trustees 2012; FL TIG 2019; USDA-APHIS-WS 2013). Adverse impacts would primarily occur due to habitat disturbance from human presence and accidental trapping (FL TIG 2019). Habitat-related disturbance from human presence would be temporary, and the Implementing Trustee would avoid night-time activities to reduce disturbance to nocturnal species and limit light pollution on sea turtle nesting beaches. As described in the USDA EA, "lethal removal by shooting is nearly 100% selective for target species" and would therefore only negatively impact non-target wildlife through temporary habitat disturbance (USDA-APHIS-WS 2003). Additionally, carcasses would be removed from nesting areas to avoid attracting additional predators.

Terrestrial wildlife and protected species may be accidentally caught in live traps intended for target predators. The Implementing Trustee would employ BMPs[59] including using the most selective methods for target species, using attractants that are specific to target species, and placing traps in areas that avoid exposure to non-target species (USDA-APHIS-WS 2013). Additionally, set traps would be checked frequently, and if a non-target animal is inadvertently caught it would be released if the animal is injury-free or it is otherwise safe to release the animal (DWH Trustees 2012). Consistent with determinations from the USDA EA, this project may affect, but is not likely to adversely affect protected species near the project area and this project would not impact overlapping critical habitat (USDA-APHIS-WS 2013). The FL TIG has complete technical assistance with relevant regulatory agencies on this project regarding potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status.

Although avian and nest predation are part of normal ecological processes, overabundant predator populations due to proximity to human communities place additional stressors on shorebirds and seabirds whose coastal nesting and foraging habitat continues to decline. Florida Shorebird Program monitoring data suggests that nest depredation is a leading cause of shorebird nest and seabird colony failure in Northeast Florida (FSD 2020). This project would provide long-term benefits to target bird species (American oystercatchers, least terns, black skimmers, and Wilson's plovers) as well as ancillary

[59] FWC follows trapping standards outlined by the Association of Fish and Wildlife Agencies (www.fishwildlife.org/afwa-inspires/furbearer-management).

benefits to other nesting species subject to nest depredation (e.g., sea turtles, crocodiles [*Crocodylus acutus*]) through non-lethal and lethal predator management. Additionally, managing predators can improve habitat condition, reduce injury and mortality to wildlife and protected species, and improve biodiversity of Northeast Florida's coastal ecosystem.

In summary, this project is anticipated to result in short- and long-term, moderate adverse impacts on predator species and short-term, minor adverse impacts and long-term benefits to all other biological resources.

Socioeconomic Resources

This project has the potential to result in short-term adverse impacts to tourism, recreation, and aesthetics during predator removal activities. However, effects to tourism and recreational use and aesthetics and visual resources would be mitigated by conducting trapping or lethal predator management activities at times of day or in locations where human presence would be minimal (USDA-APHIS-WS 2013). Additionally, all lethal and non-lethal methods that could negatively impact human health and safety would be performed by trained and permitted personnel to reduce risks to public health and safety.[60] This project would have a negligible adverse impacts on recreational hunting and trapping of predator species such as raccoons, opossums, skunks, and coyotes because it would not change associated hunting regulations.

As analyzed in the USDA EA, predator management activities would likely have long-term, minor adverse impacts to wildlife viewing (USDA-APHIS-WS 2003, 2013). This is because viewing predators is desirable to some visitors. While predation management does not seek to eradicate any species from a localized area, it may result in a noticeable decrease in predator populations and negatively impact wildlife viewing. However, predation management should also provide long-term benefits to wildlife-related tourism and recreation by restoring natural environments and biodiversity that enhance the natural habitat and aesthetics of the area (USDA-APHIS-WS 2003, 2013).

In summary, this project is anticipated to result in long-term minor adverse impacts and long-term benefits to socioeconomic resources, specifically socioeconomics, tourism and recreational use, and aesthetics and visual resources.

4.8.4 B4 and B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years (Preferred) and – 10 Years

Two potential versions of this project are evaluated in this RP/EA based on two implementation timelines. The preferred 5-year project would leverage funding from other DWH restoration funding sources to provide a total of 10 years of funding for project activities. The non-preferred 10-year project would not leverage other DWH restoration funds. Both projects would employ strategies such as reducing human disturbance, improving habitat quality, reducing predation, and improving regulatory coordination to increase populations of black skimmers, least terns, American oystercatchers, Wilson's plovers, and snowy plovers. Activities most relevant to assessment of the environmental consequences include:

- Reducing human disturbance by**:**

[60] FWC follows shooting standard outlined by the International Hunter Education Association (www.ihea-usa.org/hunting-and-shooting/hunter-education/ihea-usa-standards).

    - Implementing strategies such as posting nesting, brood-rearing, and sensitive feeding habitats with symbolic fencing and/or signage;
    - Training of and coordination with law enforcement;
- Improving habitat quality by:
    - Assisting landowners, local governments, and resource management agencies by promoting BMPs;
    - Addressing activities on beaches that are incompatible with nesting shorebirds by establishing protected areas, reducing mechanical beach cleaning, limiting beach driving, and addressing conflicts with feral cat colonies;
    - Working with volunteers and partners to coordinate rooftop management (the primary nesting site of least terns in Florida), engage with building owners and managers to reduce conflict, and involve FWC law enforcement officers when take is imminent or where it has occurred; and,
    - Reducing predation by implementing lethal (e.g., coyote trapping, crow shooting) and non-lethal (e.g., perch deterrents, effigies, trash management) predation-management activities at priority nesting sites in coordination with partners and the USDA-APHIS-WS.

Both projects include a number of data-gathering and outreach and education activities that are analyzed in Section 4.4.2. The projects would be implemented at bird nesting sites throughout Florida Gulf Coast counties and Nassau, Duval, and St. Johns Counties in Northeast Florida, and most activities would occur within the same locations as do existing agency operations, including offices and equipment used by FWC and project partners. Activities would occur in a variety of public agency offices, private properties, and public lands along the Florida coast.

4.8.4.1 Resources Analyzed in Detail for this Alternative

Table 4-14 identifies how potentially affected resources are analyzed for this alternative.

Table 4-14 NEPA Assessment of Resources for B4

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.8.4.3
Hydrology and Water Quality[a]	Does not require additional analysis. Project activities would not include any in-water work or chemicals that could pollute adjacent waters.
Biological Resources	
Habitats	Analyzed in Section 4.8.4.3
Wildlife Species (including birds)	Analyzed in Section 4.8.4.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)[a]	Does not require additional analysis. Project activities would not include any in-water work or disturbance to marine or estuarine fauna.
Protected Species	Analyzed in Section 4.8.4.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.8.4.3
Aesthetics and Visual Resources	Analyzed in Section 4.8.4.3
Public Health and Safety	Analyzed in Section 4.8.4.3
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.8.4.2 Affected Environment

Proposed project activities would occur across the Florida Gulf Coast and at select sites in Northeast Florida. A description of the physical, biological, and socioeconomic resources in the affected environment for the Florida Gulf Coast is provided in Section 4.6.2.2 and for Northeast Florida in Section 4.8.3.2. Federally listed species in the project area, as identified through USFWS IPaC, are listed in Appendix E (USFWS 2018).

4.8.4.3 Environmental Consequences

Restoration activities for this project are expected to primarily benefit physical, biological, and socioeconomic resources. As concluded for the B3, Northeast Florida Coastal Predation Management project, lethal and non-lethal predator-control measures are predicted to have beneficial effects on habitats, wildlife species, and protected species due to decreased predation and habitat damage. FWC currently manages seabirds and shorebirds through the larger Florida Shorebird Program. FWC and USDA-APHIS-WS staff maintain migratory bird depredation permits from USFWS for statewide lethal and non-lethal control of avian species. Mammal removal (through lethal and non-lethal methods) would be conducted by FWC and/or USDA-APHIS-WS. Staff would follow protocols and standard permit holder requirements for mammalian removal.

The FL TIG anticipates that the environmental consequences for B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years (preferred) and B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years would be the same. While the implementation timescale is longer for B5, both projects are considered long-term projects for the purposes of this analysis (DWH Trustees 2016a).

Physical Resources

Consequences to physical resources from predator-management activities can be found in Section 4.8.3.3.

Project implementation would require foot traffic that may disrupt soils and sediments near bird-nesting sites; however, foot traffic is not expected to occur at a greater level than currently occurs for the existing Florida Shorebird Program. As such, it is expected to have a negligible adverse impact on soils and sediments in the project area. Placing symbolic fencing around bird colonies may have negligible to minor adverse impacts on soils and sediments as a result of minor erosion from hand-digging post holes.

Project activities, not including predator-management activities, are anticipated to provide long-term benefits to physical resources across Florida's Gulf Coast and Northeast Coast. Soils and sediments can be disturbed by human activities that also disturb seabirds and shorebirds. Establishing protected areas, reducing mechanical beach clearing, reducing beach driving, and reducing dispersed foot traffic, as well as other habitat improvement measures, can help reduce erosion and otherwise benefit localized soils and sediments.

In summary, this project is anticipated to result in negligible to minor short-term adverse impacts and long-term benefits to geology and substrates.

Biological Resources

Consequences to biological resources from predator management activities can be found in Section 4.8.3.3.

Project implementation would require foot traffic that may disturb coastal habitats and associated wildlife near bird nesting sites; however, foot traffic is not expected to occur at a greater level than currently occurs for the existing Florida Shorebird Program. As such, it is expected to have a negligible adverse impact on biological resources in the project area. Placing symbolic fencing (i.e., posted signs and roped off areas meant to exclude the public) around bird colonies may have short-term negligible to minor adverse impacts on habitats, terrestrial wildlife, and protected species as a result of human presence during installation and slight habitat alteration. However, fencing would be sited away from sensitive habitats or wildlife for the purposes of excluding the public from those sensitive areas. The FL TIG has completed technical assistance with relevant regulatory agencies on B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years regarding potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status. For B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years, the FL TIG would coordinate and complete consultation with relevant regulatory agencies, if necessary, prior to project implementation.

Project activities, not including predator management activities, are anticipated to provide long-term benefits to biological resources. Coastal habitats, wildlife, and protected species can be disturbed by a variety of human activities. Establishing protected areas and reducing mechanical beach clearing, beach driving, and dispersed foot traffic, as well as other habitat-improvement or enforcement measures not only improves local habitat conditions but also decreases human disturbance on coastal wildlife and protected species. Benefits to nesting seabirds and shorebirds would be localized for this project but could cumulatively result in large-scale benefits to shorebird and seabird populations with increased nest success.

In summary, the predator management activities in this project are anticipated to result in short- and long-term, moderate adverse impacts on predator species, and the other activities in this project are anticipated to result in negligible to minor short-term adverse impacts. The project is also expected to result in long-term benefits to biological resources.

Socioeconomic Resources

Habitat management and stewardship activities conducted as part of this project may result in short-term minor adverse impacts to socioeconomic resources. This project would primarily support enforcement of existing regulations or voluntary implementation of bird-conservation measures with willing landowners and public entities, resulting in negligible changes to existing policies. Minor short- and long-term adverse impacts to socioeconomic resources associated with predator-management activities are described in Section 4.8.3.3.

This project may provide long-term benefits to socioeconomic resources. Improving coordination and voluntary implementation of conservation measures with public and private entities could reduce bird-landowner conflicts and reduce regulatory violations. Additionally, improving habitats and bird populations would enhance aesthetic and visual resources and thereby enhance tourism and recreation associated with wildlife viewing. Additional benefits to socioeconomic resources associated with predator-management activities are described in Section 4.8.3.3.

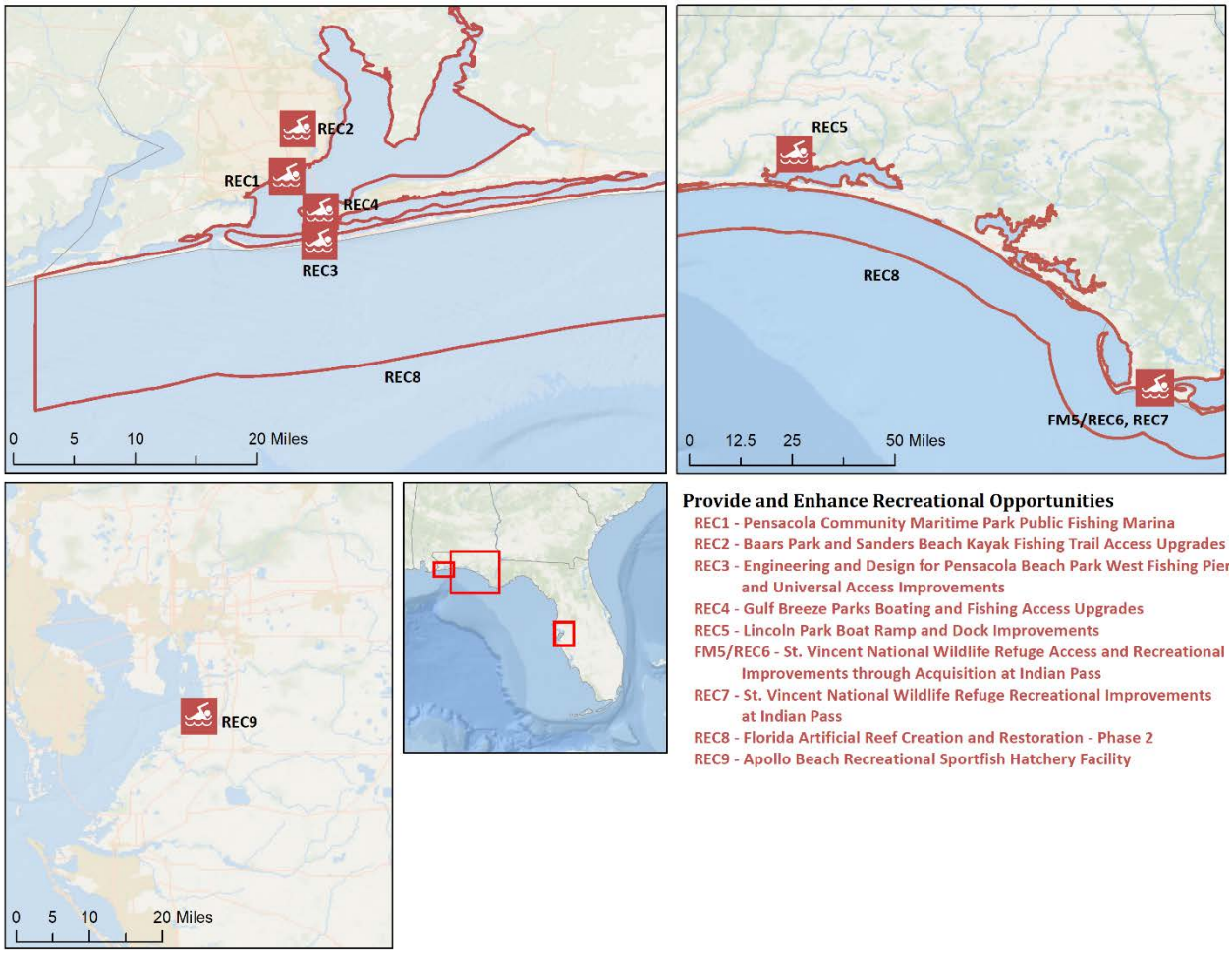
In summary, this project is anticipated to result in short- and long-term minor adverse impacts and long-term benefits to socioeconomic resources.

4.8.5 No Action

Under the No Action alternative, the bird restoration alternatives proposed in this RP/EA would not occur. Potential short-term and temporary adverse impacts to physical, biological, and socioeconomic resources associated with the proposed bird restoration would not occur. If the projects are not implemented, minor to moderate, short- and long-term adverse impacts on wildlife are anticipated including poor habitat quality and reduced ecosystem function at the proposed project sites and bird mortality due to predators. In summary, under the No Action alternative, no short-term and temporary adverse impacts would occur, but also no long-term benefits would be realized.

4.9 Provide and Enhance Recreational Opportunities

Figure 4-5 Provide and Enhance Recreational Opportunities project locations



The nine projects under the Provide and Enhance Recreational Opportunities Restoration Type are located across Florida (Figure 4-5):

- **REC1, Pensacola Community Maritime Park Public Fishing Marina (preferred)**.
- **REC2, Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades (preferred)**.
- **REC3, Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements (preferred)**.
- **REC4, Gulf Breeze Parks Boating and Fishing Access Upgrades (preferred)**.
- **REC5, Lincoln Park Boat Ramp and Dock Improvements (preferred)**.
- **FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (preferred)**.
- **REC7, St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass**.
- **REC8, Florida Artificial Reef Creation and Restoration – Phase 2 (preferred)**.
- **REC9, Apollo Beach Recreational Sportfish Hatchery Facility (preferred)**.

Note that REC3, Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements (preferred) includes only E&D activities, and as such, is covered in Section 4.2.1 and not analyzed further below. Also, FM5/REC6 is addressed in Section 4.5.2.

4.9.1 Pensacola River and Bay Watershed

As shown in Figure 4-5, four projects are located in Pensacola Bay watershed:

- Pensacola Community Maritime Park Public Fishing Marina (REC1);
- Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades (REC2);
- Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements (REC3)[61]; and,
- Gulf Breeze Parks Boating and Fishing Access Upgrades (REC4).

4.9.1.1 Area Overview

The contributing watershed of the Pensacola Bay system covers approximately 6,800 square miles from southern Alabama through the western Florida Panhandle. In Florida, the watershed includes most of Escambia, Santa Rosa, and Okaloosa Counties and northwest Walton County. Three major rivers characterize the watershed: the Escambia, Blackwater, and Yellow Rivers, as well as the smaller East Bay River. These, in turn, discharge into coastal Escambia Bay, Pensacola Bay, Blackwater Bay, East Bay, and Santa Rosa Sound. Alluvial and blackwater rivers, floodplain swamps, tidal marshes, seagrasses, and oyster beds, among other types of natural communities characterize this ecologically diverse watershed. Coastal waters support numerous species of fish, shellfish, and wildlife, and wetlands and coastal barriers buffer the adverse impacts of storms and stormwater runoff. Physical and biological resource descriptions presented here are summarized primarily from information provided in the Pensacola Bay Surface Water Improvement and Management Plan (Northwest Florida Water Management District [NWFWMD] 2017). Other sources are cited.

Physical Resources

Escambia Bay, Blackwater Bay, and East Bay, as well as Grande, Chico, and Texar bayous, are all part of the Pensacola Bay. Carpenter Creek and Jones Swamp contribute to flows into the bayous near the City of Pensacola. Major bayous on Escambia Bay in Santa Rosa County are Mulatto Bayou and Indian Bayou. The City of Gulf Breeze also has large bayous on the south shore of Pensacola Bay. The three major river systems in the watershed begin as blackwater streams in southern Alabama. The Escambia River is the largest of the three, flowing 240 miles from Alabama to Escambia Bay, with 90 percent of its 4,200-square mile watershed in Alabama. The Blackwater River and its tributaries are relatively shallow sand-bottomed streams and the lower river is tidally influenced. The river basin is approximately 860 square miles in size, of which 81 percent is in Santa Rosa and Okaloosa Counties. East Bay River, a smaller 15-mile river located in coastal Santa Rosa and Okaloosa Counties, enters East Bay near Navarre and Eglin AFB. The Yellow River is a sand bottom river with shallow clear-tan waters. It intersects the Western Highlands Physiographic Region, where bluffs along the river are conspicuous, prior to the river discharging into Blackwater Bay from the east. The river meets with the 33-mile Shoal River near the

[61] Analysis for REC3, Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements can be found in Section 4.4.1.

City of Crestview. The watershed has a drainage area of about 1,365 square miles in size, mostly (64 percent) in Florida.

The Pensacola Bay watershed encompasses two localized physiographic regions in Florida: the Western Highlands subdivision of the Northern Highlands and the Gulf Coastal Lowlands. Both physiographic regions exhibit unique geology and soils. The Northern Highlands are underlain by the Citronelle formation, ancient delta deposits of clays, clayey sands, and gravel, deposited on limestone bedrock. The Coastal Lowlands are described as a flat, weakly dissected alluvial plain formed by deposition of continental sediments onto a submerged, shallow continental shelf, that were later exposed by sea level subsidence. In the Coastal Lowlands, ancient marine geomorphic features including beach ridges, spits, bars, dunes, and terraces make up the modern topography.

Agriculture, silviculture, and recreational land uses, as well as erosion of unpaved roads, have led to increased sedimentation throughout the watershed. More than 25 percent of the roads in the Yellow River have an unpaved or gravel surface and are subject to erosion, degradation, and sedimentation within watercourses, streams, and rivers. Site-specific erosion and sedimentation were the predominant factor impairing water quality at sites in the Yellow River watershed. A long history of industrial land use in the region has also resulted in several significant instances of ground-water contamination. There are five USEPA National Priority List (NPL) Superfund sites documented in the Pensacola Bay watershed.

The FDEP has identified 25 segments within the Pensacola Bay watershed as impaired, based on Florida's Impaired Surface Waters Rule, Chapter 62-303, Florida Administrative Code. Waterbody segments verified as impaired based on sufficient data and identified causative pollutants, form the list of waters for which total maximum daily loads are or would be developed as part of the FDEP watershed management approach for protecting water resources. Nearly all segments are impaired for bacteria, two segments for nutrients, and two segments for metals (FDEP 2020d). Additional bacteria impairments are concentrated in the Yellow River and Blackwater River basins. Nonpoint source pollution is carried into the Pensacola Bay system by stormwater runoff from such sources as urban and suburban lands, agricultural and forestry activities, dirt roads, pavement, construction sites, golf courses, and lawns. The low-energy system also has water exchange with the Gulf, and pollutant loading has possibly been exceeding its assimilative capacity for decades.

Water-quality issues identified in the watershed (NWFWMD 2017) include: impairments for nutrients, dissolved oxygen, and bacteria; long-term degradation of urban bayous and Escambia Bay; vulnerability of habitats due to water-quality degradation; inadequate treatment from conventional onsite sewage treatment and disposal system and aging water infrastructure (e.g., leaking pipes) and resulting surface- and ground-water degradation, erosion, and sedimentation. Eutrophication has been documented in several waterbodies across watershed, primarily in the bays and estuaries. Chemical contaminants within the sediments have been observed in many areas of the estuary, particularly within Bayous Chico and Texar and in Escambia Bay.

Biological Resources

Biological resources are concentrated in natural areas outside of the developed urban and agriculture portions of the watershed. Wetlands and floodplains are most extensive along the Escambia and Yellow Rivers, Garcon Point, and the East Bay River and Jones Creek basins. Upland forests occur throughout the watershed, between the river corridors. Many of the native pine forests have been cut for timber, cleared for agriculture, or intensively managed for silviculture and uplands in the watershed are a mix of

natural regeneration forests, pine plantations, agricultural lands, and development. Riparian habitats along river corridors are important to fish and wildlife. The Yellow River Marsh Preserve State Park includes tracts of wet prairie classified by the FNAI as imperiled in Florida because of their rarity. Nearly 20 rare and endangered species of plants and animals occur in the wet prairies, dome swamps, and flatwoods of this park. Conservation and recreational lands make up a substantial part of the Pensacola Bay watershed and include Blackwater River State Forest; Blackwater, Yellow, and Escambia Rivers Water Management Areas; and Garcon Point Water Management Area. Large tracts of Eglin Air Force Base are also managed for habitat conservation and the protection of endangered species. Benthic riverine and estuarine habitats in the watershed have historically, and are presently, adversely impacted by sediment erosion and deposition. The Yellow River Basin is historically less developed than the rest of the watershed but is increasingly degraded by excessive sedimentation from stream bank erosion, particularly along unpaved road crossings, contributing to habitat degradation, adverse impacts to federally listed species, and threats to aquatic biodiversity in the basin (Herrington et al. 2011). Degraded water and sediment quality have also reduced the extent of SAV communities, other benthic habitats, and associated biological resources.

The Pensacola Bay watershed supports an estimated 1,400 estuarine plant and animal species, in addition to migratory species. Invertebrates include snails, insects, crustaceans, as well as threatened and endangered mussels. Thirteen species of common waterfowl winter in Pensacola Bay salt marshes (Lewis 1986). Salt marshes, SAV beds, and oyster reefs support more than 200 species of fish and shellfish reported in the Pensacola Bay system. SAV meadows are largely limited to Santa Rosa Sound, while salt marshes are more common in lower East Bay and Garcon Point in comparison with upper East and Blackwater Bays. Of an estimated 235-245 acres of oyster reef habitat in the Pensacola Bay system, approximately 75 percent are in East Bay.

The Escambia River and the Blackwater River are two large alluvial rivers that flow south from Alabama through the Florida Panhandle to the Pensacola Bay Estuary and the Gulf. Both basins are highly productive and serve as nurseries for commercially important shellfish and finfish, as well as a diverse array of flora and fauna.

Approximately 40 species of plants and 45 species of animals designated as state or federally threatened and endangered occur in the watershed. Federally threatened and endangered species and their corresponding habitats and critical habitat (if designated) specific to the Pensacola Bay watershed are listed in Appendix E. EFH for red drum, reef fish, shrimp, and coastal migratory pelagic fish is designated in coastal waters of the watershed (NOAA 2018). Natural systems priorities in the watershed are wetland loss and degradation (e.g., Carpenter Creek); vulnerability of estuarine and coastal habitats, legacy pollutants in estuarine substrates, effects of sea-level rise and saltwater intrusion; physically altered tributaries; and headwaters degradation, floodplain fragmentation, riparian buffer loss.

Socioeconomic Resources

The Pensacola Bay watershed primarily encompasses Escambia, Santa Rosa, and Okaloosa Counties. Escambia County had a total population of 318,316 people, an increase of 73 percent since 2010, based on the 2019 U.S. Census. Escambia is demographically similar to the state of Florida as a whole, as shown in Appendix D. The percent of white individuals in Escambia County (68.9 percent) is lower than for Florida and the U.S., both approximately 77 percent (U.S. Census Bureau 2019). Across all three geographic areas the percent of the population (aged 25 or older) with a high school education or higher

is between 87 and 91 percent. The percent of the population (aged 16 or older) in the labor force in Escambia County (56.9 percent) is similar to that of Florida (58.3 percent) and is lower than that of the U.S. as a whole (62.9 percent) (U.S. Census Bureau 2019). Following this trend, median household income ($49,285) is similar to Florida ($53,267) and lower than the U.S. ($60,293). With respect to poverty, the percent of the population living in poverty in Escambia County (14.7 percent) is slightly higher than the typical rate in Florida (12.7 percent), and is higher than is typical in the U.S. (10.5 percent) (U.S. Census Bureau 2019).

Santa Rosa County had a total population of 184,313 people, an increase of 21.8 percent since 2010, based on the 2019 U.S. Census. Santa Rosa County is also demographically similar to Florida and the U.S. as a whole, as shown in Appendix D. The percent of white individuals in Santa Rosa County (86.9 percent) is higher than Florida and the U.S., both approximately 77 percent (U.S. Census Bureau 2019). The percent of the population (aged 25 or older) with a high school education is 91.6 percent similar to Florida and for the U.S. (both approximately 88 percent). The percent of the population (aged 16 or older) in the labor force in Santa Rosa County (56.4 percent) is slightly lower but similar to Florida and U.S. levels (58.3 and 62.9 percent respectively) (U.S. Census Bureau 2019). Median household income ($66,242) is higher than both the U.S. ($60,293) and Florida ($53,267). The percent of the population living in poverty is lower in Santa Rosa County (9.5 percent) than in Florida and the U.S. (12.7 percent and 10.5 percent respectively; U.S. Census Bureau 2019).

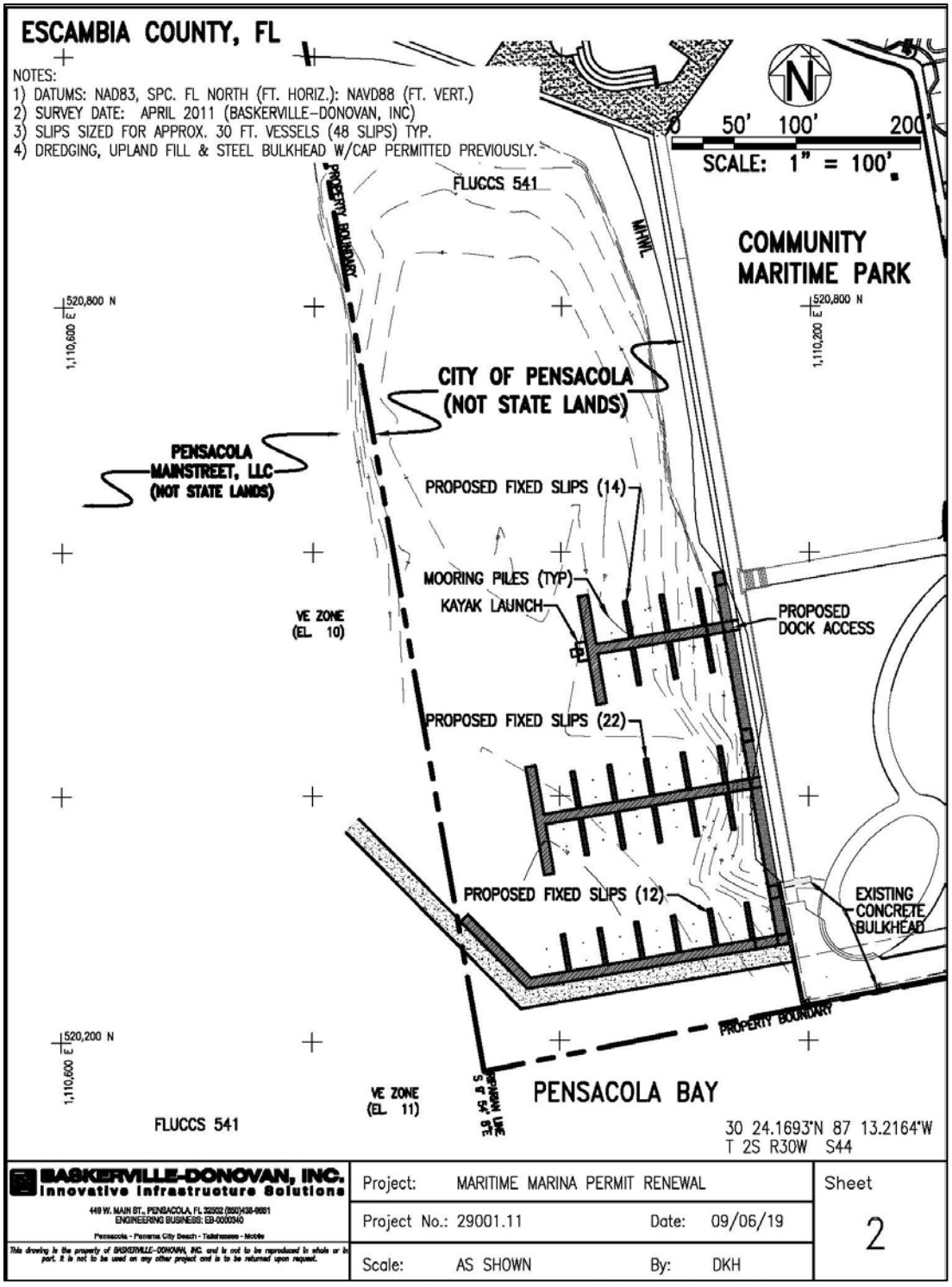
Okaloosa County had a total population of 210,738 people, an increase of 16.5 percent since 2010, based on the 2019 U.S. Census. Approximately 81.1 percent of the County population is white, 10.5 percent are black or African American and about 9.7 percent Hispanic or Latino. The remaining population includes small percentages of American Indian, Asian, and Pacific Islander. Median household income reported in 2019 in the County was $62,048 and the percent of County residents living in poverty accounted for 12.7 percent of the population. Most of the County residents (91.8 percent) are high school graduates or higher.

4.9.1.2 REC1, Pensacola Community Maritime Park Public Fishing Marina (Preferred)

The goal of the project is to provide and enhance recreational fishing opportunities by constructing a day-use public fishing marina in Pensacola Bay. The marina would primarily be used to support public and charity fishing tournaments. When not in use in support of fishing events, the marina would be available for day-use vessels only, as permitted by USACE. Activities most relevant to assessment of the environmental consequences of this project include:

- Construction of a designed and permitted public fishing marina (Figure 4-6) containing:
    - 48-vessel slips (with access docks measuring 30 feet long by 3 feet wide);
    - Three floating piers (281 feet, 184 feet, and 119 feet long; all 8 feet wide); and,
    - One floating kayak launch.

Figure 4-6 Conceptual drawing for REC1, Pensacola Community Maritime Park Public Fishing Marina



Resources Analyzed in Detail for this Alternative

Table 4-15 identifies how potentially affected resources are analyzed for this alternative.

Table 4-15 NEPA Assessment of Resources for REC1

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.9.1.2
Hydrology and Water Quality	Analyzed in Section 4.9.1.2
Biological Resources	
Habitats	Analyzed in Section 4.9.1.2
Wildlife Species (including birds)	Analyzed in Section 4.9.1.2
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.9.1.2
Protected Species	Analyzed in Section 4.9.1.2
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.9.1.2
Aesthetics and Visual Resources	Analyzed in Section 4.9.1.2
Public Health and Safety	Analyzed in Section 4.9.1.2
Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

Affected Environment

This project would be constructed along the western waterfront of Pensacola Community Maritime Park, which sits on the north end of Pensacola Bay in the Inner Harbor. The park and the surrounding areas are heavily developed urban areas. This project would primarily occur in-water with some dock access sites constructed along the western edge of the park. The proposed marina would sit behind a 425-foot-long breakwater that was constructed in 2015 to provide erosion and wave protection to the marina.

Physical Resources

Community Maritime Park is located in the Florida Panhandle, directly adjacent to the Inner Harbor in Pensacola Bay. The park is predominantly flat, with soils classified as Arents-Urban land complex, a marine terrace (USDA-NRCS 2020). Construction equipment may be staged in the park's open spaces near the project site; however, project improvements would primarily occur in marine and estuarine waters alongside the park. The Inner Harbor is bound to the west by Bayou Chico, the east by the Pensacola Bay Bridge, and the south by the City of Gulf Breeze. Water depths in the Inner Harbor are generally shallow (7 feet or less), except within the dredged West and East Approach Channels. Water depths at the project site range between 0-7 feet deep. The project location is tidally influenced with about a 1.2-foot difference between MHW and MLW. Pensacola Bay's Inner Harbor is listed as 303d impaired waterbody for nutrients (FDEP 2020d). Estuarine and marine wetlands are present along the northern edge of the project site (based on the most updated wetland assessment; USFWS 2018) but are not expected to be negatively impacted by project activities. The project site sits within FEMA-designated Flood Zone VE with minimal flood elevation of 10-11 feet (FEMA 2020).

Biological Resources

Community Maritime Park is highly developed with some open, landscaped green space. The marina site is also highly developed, sitting between the previously constructed breakwater and the park's western bulkhead. Based on available information, the project site is primarily unconsolidated sandy benthic habitat (NOAA OR&R, UNH, and USEPA 2018). Although SAV is known to occur in the greater Pensacola Bay, there is no known SAV at the project site (FWC 2018). EFH for coastal migratory pelagics, red drum, reef fish, and shrimp overlaps with the project site (NOAA 2018).

Fish and wildlife potentially present in and around the site include migratory birds, common terrestrial mammals (e.g., raccoons, opossums, squirrels), and select aquatic and terrestrial protected species. Migratory birds could potentially use this site for nesting, foraging, roosting, and breeding. Potential migratory bird groups include wading birds, shorebirds (e.g., terns), raptors, and songbirds. There are no bald eagles known to be present at this site (USFWS 2018). Although these bird species could occur around the project site, they are not known to inhabit or nest in the action area or in the nearby vicinity.

The current federal species list, as identified through IPaC, is summarized in Appendix E (USFWS 2018). There is no terrestrial critical habitat in the action area for the project. There is marine critical habitat for Gulf sturgeon in Pensacola Bay (Unit 9; NOAA Office of Response and Restoration [OR&R], University of New Hampshire [UNH], and USEPA 2018). The Pensacola Bay/East Bay Stock of common bottlenose dolphins and the West Indian manatee could be found in the action area (Hayes et al. 2020).

Socioeconomic Resources

Community Maritime Park currently provides various land-based recreational amenities such as greenspace, an amphitheater, a sports stadium, and play structures. No water access currently exists at the park. The park is owned by the City of Pensacola and is free and open to the public. The area surrounding the park is highly developed; downtown Pensacola is located a few blocks from the park.

Environmental Consequences

This proposed alternative would add a day-use public marina to the western edge of Community Maritime Park. No motorized vessel access sites would be added to the park, so all vessels would access the marina from Pensacola Bay. The marina would include a kayak launch. Existing walking paths and parking areas at the park would be used for kayak access to the new marina.

Physical Resources

Implementation of this project could include use of heavy construction equipment, such as bulldozers, trucks, backhoes, tractor trailers, cranes, small excavators, forklifts, asphalt machine, roller, small power tools, generators, small trucks, and hand tools.

This project includes construction of three piers, slip access docks, and installation of a floating kayak launch. New pilings would need to be installed for the piers (approximately 21 structural piles and 48 mooring piles). The proposed piers and kayak launch would be ADA-compliant. The kayak launch would be attached to the middle pier and would be used to put-in and take paddlecraft out of the water. The first pier would be built along the existing breakwater and contain 12 vessel slips. Six slip docks would be perpendicular to the pier at 30 feet long by 3 feet wide. This pier would be approximately 281 feet long and 8 feet wide. The second pier would be built perpendicular to the existing park bulkhead which runs in a north-south orientation, would contain 22 vessel slips, and would be approximately 184 feet long by 8 feet wide. This pier would have 10 slip docks. The third pier (the northernmost pier) would also be

built perpendicular to the existing park bulkhead which runs in a north-south orientation. This pier would contain 14 vessel slips and a floating kayak launch at the end of the T-dock. The pier would be approximately 119 feet long and 8 feet wide and contain six slip access docks (Figure 4-7). All pier structures would be floating and sit about 1 foot higher than the water level. The marina would have a total overwater area of approximately 10,364 square feet. In-water dredging or digging associated with installation of the pilings for the marina is not anticipated, though substrate displacement and compaction from piling installation is expected. Piling embedment depth would be subject to final design. The piles would be placed using the least invasive techniques (e.g., jetting, pushing, or driving the piles) where possible, but could use impact hammers, given substrate and construction-cost considerations.

Upland portions of Community Maritime Park would primarily be used for access and staging purposes. Avoidance of trees and habitat are proposed, but any unavoidable tree removal or structure removal would require materials to be removed from the site via trucks. Short-term disturbances to terrestrial soils and substrates may occur as a result of construction and site preparation activities. However, the adverse impacts would be localized to approximately 1.5 acres. Thus, with the impacts localized to the site, this project would have short-term minor adverse impacts to upland area.

Specific mitigation measures such as erosion-control plans and silt curtains would be implemented during construction to minimize erosion and overall adverse substrate impacts. Construction involving substrate compaction, displacement, and erosion would have short- and long-term minor adverse impacts on geology and substrates. This project would result in minor short- as well as long-term adverse impacts on water quality and hydrology due to increased sedimentation and potential vessel-based pollution. The project would utilize an existing breakwater to protect the marina, which would minimize erosion in the boat basin and lessen the need for future dredging, mitigating long-term adverse impacts to water quality.

In summary, this project is anticipated to result in short- and long-term minor adverse impacts to physical resources.

Biological Resources

The marina would be constructed in previously undisturbed marine habitat located behind the existing breakwater. The marina site would be accessed through the adjacent developed community park that contains open greenspace and various recreational infrastructure. Where possible, staging and access would occur in areas that are developed and disturbed with minimal vegetation. However, some water-based access and construction by barge may occur. This project has been permitted by the USACE pursuant to Section 404 of the CWA regarding adverse wetlands impacts. The project would follow PDC for pile-supported structures as outlined in the NMFS Programmatic Biological Opinion on 10 Categories of Minor In-water Activities Occurring in Florida and the U.S. Caribbean; USACE Jacksonville District Programmatic Biological Opinion (JAXBO; PDC AP, 1-11 and A2.1-9; NMFS 2017) and PDC for non-fishing piers as outlined in Appendix A of the NMFS Framework Biological Opinion on the DWH PDARP/PEIS (NMFS 2016c) to minimize adverse impacts to marine habitats and species.

In-water construction activities associated with this alternative could result in short-term, moderate adverse impacts to aquatic habitat due to erosion and increased turbidity and short-term moderate adverse impacts to wildlife and marine and estuarine fauna from construction-related noise and human disturbance. In-water construction would include placement of 21 concrete piles using least invasive

techniques (e.g., jetting, pushing, driving) where possible; however, impact hammers could be used given substrate and construction cost considerations. Floating docks would be attached to the pilings for the marina structure. The release of sediments during in-water construction would be controlled using BMPs and mitigation to protect aquatic habitats, prevent the transport of sediment into waterways, confine adverse impacts to construction sites, and minimize the magnitude of adverse impacts on water quality in Pensacola Bay. Construction activities would be temporary and localized to the site, and habitat fragmentation would be limited. As such, this project would have long-term, moderate adverse impacts on aquatic habitat due to habitat conversion.

Recreational fishing opportunities enhanced through this project are not anticipated to negatively impact marine fauna and protected species since fishing would not be allowed from the marina structure. The marina would support day-use fishing activities by providing temporary mooring for 48 vessels. Since the marina would not provide new permanent docking within the area, the project is not expected to increase fishing activity over existing levels in the region. However, if recommended during environmental consultations, BMPs would still be implemented to reduce adverse fishing impacts on protected species, including reporting incidental hook and line capture of listed species, posting educational signage to inform anglers about how to respond to incidental hooking events, and installing monofilament recycling bins at various sites around the marina. Some minor, long-term adverse impacts may occur to terrestrial wildlife and marine and estuarine fauna (including protected species) from human-caused disturbance associated with recreators using the marina.

The FL TIG has completed technical assistance with relevant regulatory agencies related to potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status. ESA consultation for species under NMFS purview is complete per the JAXBO which is part of the USACE permitting process (NMFS 2017). Conservation measures recommended during consultation or required as permit conditions would be incorporated into final project design and implementation to avoid and/or minimize adverse impacts to protected species and critical habitats. Specific conservation measures would also be implemented during construction to avoid and minimize disruption and overall adverse impacts to protected species. Below is a list of potential protected species at the project site, effects from the project activities, and potential conservation measures.

Sea turtles: Loggerhead, green, leatherback, hawksbill, and Kemp's ridley sea turtles could be present in the area. Turtle nesting typically occurs on Gulf side sandy beaches during the months of May through August, with hatching occurring from late July through October; nesting does not occur on the bay side where the project would be implemented. Sea turtles may be adversely impacted by noise associated with construction activities. There is potential for sea turtle encounters with private vessels using the marina as turtles forage in the vicinity. However, boating levels would have a negligible increase since the marina would not provide additional long-term boat storage. If recommended during environmental compliance review, BMPs such as those identified within the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) and Measures for Reducing the Entrapment Risk to Protected Species (NMFS 2012) would be implemented and adhered to during periods of in-water work. BMPs identified within the Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS 2008) would also be implemented if recommended. As concluded in JAXBO, this project would have minor, short- to long-term adverse impacts on sea turtles.

Giant manta ray. Giant manta rays inhabit a wide variety of nearshore and offshore productive marine habitats. Since Pensacola Bay is open to the Gulf where giant manta rays are known to occur, the species could be present in the Bay. Boat strikes and fishing gear entanglement are known causes of injury and mortality to giant manta rays. Since giant manta rays are highly mobile, they would likely avoid the area during construction. To avoid and minimize adverse impacts, BMPs recommended during environmental compliance review would be implemented and adhered to during periods of in-water work. As a result of construction-related activities from these improvements, this project may have direct and/or indirect short-term minor adverse effects on the giant manta ray.

West Indian manatee and marine mammals. The project location does not intersect with any identified critical habitat for the West Indian manatee, but manatees could potentially be present in Pensacola Bay. Additionally, the Pensacola Bay/East Bay Stock of bottlenose dolphins could be present in the project area. Marine mammals are affected by vibrations and noise resulting from construction activities (e.g., generators, pile drivers). This project includes in-water work for the fishing marina construction. If recommended during environmental compliance review, the BMPs identified within the Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS 2008), and the Standard Manatee Conditions for In-water Work (USFWS 2011) would be implemented and adhered to during periods of in-water work. Additionally, mitigation measures to reduce adverse noise impacts to marine mammals, such as establishing a 25-meter shutdown zone around pile driving activities and using soft-start techniques when commencing pile driving, would be implemented. As a result of construction related activities from these improvements, this project may have minor to moderate short-term adverse effects on the West Indian manatee and other marine mammals.

Gulf sturgeon, Gulf sturgeon critical habitat, and smalltooth sawfish: There is critical habitat for Gulf sturgeon (Unit 9) in Pensacola Bay, and sturgeon are known to be in the bay and along the Gulf shoreline. Smalltooth sawfish inhabit nearshore sandy substrate habitats and may be located in the action area. Potential adverse impacts to sturgeon and sawfish include elevated noise levels and the presence of suspended sediments in the water column due to construction-related activities. However, sturgeon and sawfish are highly mobile and can avoid any disturbances in that area by swimming away. If recommended during environmental compliance review, standard BMPs such as those identified in the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) and Measures for Reducing Entrapment Risk to Protected Species (NMFS 2012), would be followed. As a result of proposed construction activities for the marina and anticipated recreational uses, this project component may have short- to long-term minor adverse effects on sturgeon and smalltooth sawfish and would likely have long-term minor adverse effects on Gulf sturgeon critical habitat.

Gopher tortoise. The gopher tortoise is a terrestrial turtle that occurs in well-drained sandy soils in sandhill, scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, and mixed hardwood pine habitats. While upland areas of Community Maritime Park do not contain gopher tortoise habitats, the species has been previously spotted in Pensacola. If any burrows or individuals are encountered in construction and staging areas, they may be relocated (after consulting with USFWS). As such, this project would have negligible to minor short-term adverse impacts to gopher tortoises.

Eastern indigo snake. The Eastern indigo snake inhabits a wide range of habitat types, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. It frequently co-inhabits gopher

tortoise burrows; thus, the Eastern indigo snake would be subject to the same removal and relocation efforts as gopher tortoises if encountered. If recommended during environmental compliance review, the BMPs outlined in the Standard Protection Measures for the Eastern Indigo Snake (USFWS 2013) would be implemented. Thus, this project would have negligible to minor short-term adverse impacts to Eastern indigo snakes.

In summary, this project is anticipated to result in short- and long-term, minor to moderate adverse impacts to biological resources.

Socioeconomic Resources

During the construction phase of this project, construction equipment and operations would likely be located in previously disturbed areas and parking lots. To the extent required, the use of construction equipment, including equipment used for the movement and placement of materials and barriers enacted to protect public safety would result in some minor to moderate short-term adverse impacts on aesthetics and visual quality. These impacts result from the presence of equipment, barriers, and construction-related dust and emissions. During the construction period, visible impediments would detract from the natural landscape and create visual contrast for observers. Short-term closures of public areas may be required to accommodate construction activities, which could adversely affect visitors.

From the public perspective, the site would be managed as it is at present, by the City of Pensacola, and adding a new public day-use marina should improve and enhance visitor experiences in the Pensacola Inner Harbor. Installing an ADA-accessible kayak launch would also increase water-based recreational opportunities for persons with limited mobility. The project would be expected to result in a short-term increase in construction jobs.

In summary, the project is anticipated to result in short-term minor adverse impacts to existing infrastructure and utilities, tourism, and recreation, and aesthetics and visual resources. The project improvements would also provide short-term economic benefits through employment opportunities as well as long-term improvements to recreation for marina visitors over the long-term.

4.9.1.3 REC2, Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades (Preferred)

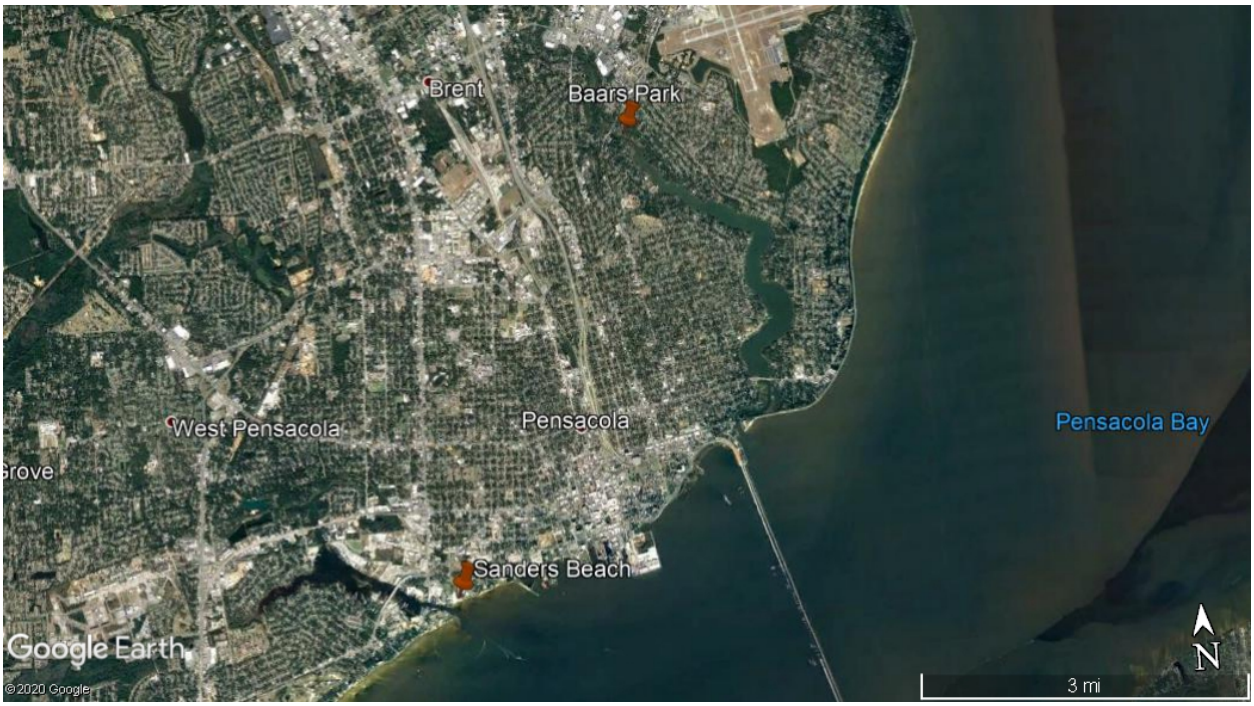
The goal of this project is to provide and enhance recreational paddling opportunities by creating recreational amenities and water access points at two locations in Pensacola, Baars Park and Sanders Beach (Figure 4-7). Activities most relevant to assessment of the environmental consequences of this project include:

- Creating recreational infrastructure at Baars Park:
    - Constructing a fishing pier and dock with specialized kayak and accessible entry (only for non-motorized watercraft);
    - Constructing a small, unpaved parking lot with approximately eight parking spaces;
    - Constructing a picnic area/shelter[62];
    - Installing monofilament recycling bins;

[62] Final inclusion of this amenity would be subject to public input.

- Enhancing existing infrastructure at Sanders Beach:
    - Converting the existing powercraft launch to an accessible kayak launch (method to be determined);
    - Installing floating accessible kayak launches to the two existing docks;
    - Reconfiguring, and possibly expanding, the existing parking lot; and,
    - Installing monofilament recycling bins.

Figure 4-7 Baars Park and Sanders Beach Locations in Pensacola, Florida



Resources Analyzed in Detail for this Alternative

Table 4-16 identifies how potentially affected resources are analyzed for this alternative.

Table 4-16 NEPA Assessment of Resources for REC2

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.9.1.3
Hydrology and Water Quality	Analyzed in Section 4.9.1.3
Biological Resources	
Habitats	Analyzed in Section 4.9.1.3
Wildlife Species (including birds)	Analyzed in Section 4.9.1.3
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.9.1.3
Protected Species	Analyzed in Section 4.9.1.3
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.9.1.3
Aesthetics and Visual Resources	Analyzed in Section 4.9.1.3
Public Health and Safety	Analyzed in Section 4.9.1.3
Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

Affected Environment

This project would be implemented at two existing parks in Pensacola: Baars Park and Sanders Beach. Baars Park is located upstream on Bayou Texar while Sanders Beach is located along the northern edge of Pensacola Bay, west of the Inner Harbor. Baars Park is a largely undeveloped wooded parcel within a residential area of Pensacola while Sanders Beach is highly developed. The proposed alternative would add new recreational amenities to Baars Park and enhance existing infrastructure at Sanders Beach.

Physical Resources

Baars Park and Sanders Beach are located in the Florida Panhandle along the outskirts of Pensacola. Both sites are predominantly flat, with soils classified as Troup sand (eight to 12 percent slopes), Hurricane sand (0-5 percent slopes), Dirego tidal muck and pits (USDA-NRCS 2020). Construction equipment may be staged in each park's open or developed spaces near the project sites. Improvements would occur uplands and in-water at both parks.

Baars Park is located along Bayou Texar, an estuary fed by Carpenter's Creek and various freshwater springs. Bayou Texar flows south, emptying into Pensacola Bay. The park is located approximately 3.75 miles upstream from where Bayou Texar empties into Pensacola Bay. Water depths in the Bayou are generally shallow, approximately 2-3 feet at MLW. In-water work at the park would be conducted in waters less than 6 feet deep. There are various estuarine and marine wetlands designations at the park (based on the most updated wetland assessment; USFWS 2018). Upland portions of the park sit within FEMA-designated Flood Zone AE with minimal flood elevation of 6 feet (FEMA 2020). Some of the upland recreational amenities may be constructed within the flood zone.

Sanders Beach sits along the north end of Pensacola Bay at the mouth of Bayou Chico, directly west of the Inner Harbor. Water depths in the Inner Harbor are generally shallow (7 feet or less), except within the channel of Bayou Chico, and the West and East Approach Channels for the Inner Harbor. Sanders

Beach sits on a part of Pensacola Bay that is listed as a 303d impaired waterbody for nutrients (FDEP 2020d). There are various estuarine and marine wetlands designations (based on the most updated wetland assessment) at Sanders Beach. The boat launch contains multiple FEMA-designated Flood Zones (i.e., Zone VE and Zone AE). Most recreational improvements would occur in both Zones VE and AE with minimal flood elevations of 8-11 feet (FEMA 2020).

Biological Resources

Baars Park is a partially developed parcel that is a mixture of developed open space and undeveloped evergreen forest (USGS 2016). Based on available information, there is no known SAV within the wetland habitats at the park (FWC 2018). EFH for coastal migratory pelagics, red drum, reef fish, and shrimp overlaps is directly adjacent to where in-water work may occur at the park (NOAA 2018).

Sanders Beach is highly developed with a minimal amount of open, landscaped green space. Based on available information, Sanders Beach contains primarily unconsolidated sandy benthic habitat (NOAA OR&R, UNH, and USEPA 2018). Although SAV is known to occur in the greater Pensacola Bay, there is no known SAV at the boat launch (FWC 2018). EFH for coastal migratory pelagics, red drum, reef fish, and shrimp overlaps with the site (NOAA 2018).

Fish and wildlife potentially present in and around the site include migratory birds, common terrestrial mammals (e.g., raccoons, opossums, squirrels), and select aquatic and terrestrial protected species. Migratory birds could potentially use Baars Park or Sanders Beach for nesting, foraging, roosting, and breeding. Potential migratory bird groups include wading birds, shorebirds (e.g., terns), raptors, and songbirds. There are no bald eagles known to be present at this site (USFWS 2018). Although these bird species could occur around the project site, they are not known to inhabit or nest in the action area or in the nearby vicinity.

The current federal species list, as identified through IPaC, is summarized in Appendix E (USFWS 2018). There is no terrestrial critical habitat in the action area for the project. There is marine critical habitat for Gulf sturgeon in Pensacola Bay (Unit 9; NOAA OR&R, UNH, and USEPA 2018). The Pensacola Bay/East Bay Stock of common bottlenose dolphin and the West Indian manatee could be found in the action area (Hayes et al. 2020).

Socioeconomic Resources

Baars Park is a largely undeveloped recreational parcel. Only an access road exists at the site. No water access is currently available at the park. Sanders Beach currently provides recreational amenities such as a motorized boat launch, access docks, parking, and restroom facilities. A number of structures at Sanders Beach (such as the boat ramp and docks) were damaged or demolished by Hurricane Sally in September 2020. Both parks are owned by the City of Pensacola and are free and open to the public. The areas surrounding the parks are primarily developed residential neighborhoods.

Environmental Consequences

This proposed alternative would add recreational infrastructure at Baars Park and enhance existing recreational infrastructure at Sanders Beach. Motorized vessels would not be permitted to use the dock or pier at Baars Park, and Sanders Beach would primarily be used for paddlecraft.

Physical Resources

Implementation of this project could include use of heavy construction equipment, such as bulldozers, trucks, backhoes, tractor trailers, cranes, small excavators, forklifts, asphalt machine, roller, small power tools, generators, small trucks, and hand tools.

This project includes construction of a fishing pier and access dock at Baars Park and installation of multiple floating kayak launches at Baars Park and Sanders Beach Boat Launch. The overwater area of the amenities would be dependent upon final design, but for the purposes of this RP/EA, it is assumed to be less than 1,000 square feet. New pilings would likely need to be installed for the pier and dock at Baars Park (approximately 4 piles). The proposed pier, dock, and kayak launches would be ADA-compliant. The kayak launches would be attached to existing docks at Sanders Beach, and the new dock at Baars Park, and would be used to put-in and take paddlecraft out of the water. The new dock at Baars Park would not support motorized vessels. In-water dredging or digging associated with installation of the pilings for the pier and dock at Baars Park is not anticipated, though substrate displacement and compaction from piling installation may occur. Piling embedment depth would be subject to final design. The piles would be placed using the least invasive techniques (e.g., jetting, pushing, or driving the piles) where possible, but could use impact hammers, given substrate and construction cost considerations.

Digging could occur in the terrestrial environment over approximately 7 acres (estimated for the purposes of this RP/EA) for parking lots (new lot at Baars Park and expanded lot at Sanders Beach) and picnic structure at Baars Park. Digging and soil disturbance is mostly proposed for previously developed land, however, the new unpaved parking lot and picnic shelter at Baars Park may negatively impact previously undisturbed soils and sediments. Construction and digging activities, including staging areas for construction equipment, would utilize existing development footprints and disturbed areas where possible, but digging and staging equipment could disturb some soils. Terrestrial work that may affect hydrology and water quality includes construction of additional impervious surfaces such as the expansion of a paved parking lot at Sanders Beach. In-water activities can temporarily negatively impact water quality by increasing turbidity.

Specific mitigation measures such as erosion control plans and silt curtains would be implemented during construction to minimize erosion and overall adverse substrate impacts. Construction involving substrate compaction, displacement, and erosion would have short- and long-term minor adverse impacts on geology and substrates. This project would result in minor short- as well as long-term adverse impacts on water quality and hydrology due to increased sedimentation and potential vessel-based pollution.

In summary, this project is anticipated to result in short- and long-term minor adverse impacts to physical resources.

Biological Resources

The additions to Baars Park would be predominantly adjacent to previously developed areas (e.g., the existing road) and undeveloped upland and in-water habitats (e.g., for the pier and dock). The additions to Sanders Beach are proposed for areas that are already developed or disturbed. The improvements would utilize existing infrastructure where possible. Any work in waters of the U.S., including wetlands, associated with this alternative would be coordinated with the USACE pursuant to Section 404 of the CWA. Coordination with the USACE and final authorization pursuant to CWA/Rivers and Harbors Act

(RHA) would be completed prior to final design and construction. USACE and NMFS construction guidelines regarding pier and dock construction would be followed where possible (USACE/NMFS 2001), and final placement and design would include considerations for ADA compliance.

Terrestrial and in-water construction activities could result in short-term, moderate adverse impacts to aquatic habitat due to erosion and increased turbidity. The release of sediments during construction would be controlled using BMPs and mitigation to protect aquatic habitats, prevent the transport of sediment into waterways, confine adverse impacts to construction sites, and minimize the magnitude of adverse impacts on water quality in Bayou Texar and Pensacola Bay.

Terrestrial and in-water construction activities would avoid wetlands to the extent practical and feasible and are subject to regulatory consultations pending the final design. A benthic survey would be completed prior to any in-water work. There is in-water work proposed for this alternative during dock construction, pier construction, and paddlecraft launch installation. Additionally, some pilings (specifically at Baars Park) may be required in shallow water areas to support the floating dock. Where possible, piles would be installed using the least invasive techniques (e.g., jetting, pushing, driving), but could use impact hammers given substrate and construction cost considerations. Specific conservation and mitigation measures would be implemented during the finalization of engineering and design plans and construction to minimize erosion and overall adverse habitat impacts.

Construction equipment and staging areas could have short-term, moderate adverse impacts to habitat, but as noted previously, these would be sited on existing development footprints where possible to minimize impacts. Although the proposed improvements could negatively impact habitats and biological resources (e.g., clearing of vegetation for a picnic area or unpaved parking lot at Baars Park), most of the improvements are proposed for currently disturbed areas and areas with grasses and vegetative understory. Additionally, the new pier and dock at Baars Park would negatively impact habitat, but ultimately, it would direct and condense foot traffic into designated areas, benefiting habitats and species over the long-term. Construction activities would be localized to the site, and habitat fragmentation would be limited. As such, project activities would have moderate, long-term adverse impacts to habitats.

The new pier at Baars Park would be used for fishing purposes and would be publicly accessible. The number of anglers is unknown and would vary with site visitation and fishing season. There is currently no parking at Baars Park; this project would add minimal unpaved parking spaces (total number of spaces to be determined). Maximum fishing would likely result in no more than 10 people at one time. No fish cleaning stations are included in project design. Monofilament recycling bins would be installed as part of the project to reduce the risk of entanglement to protected species. If recommended during environmental compliance review, BMPs to reduce adverse fishing impacts on protected species, such as reporting incidental hook and line captures of listed species and posting educational signage posted to inform anglers about how to respond to incidental hooking events would be implemented. While the public is currently able to access Baars Park and Sanders beach for recreational purposes, improved amenities may result in a higher level of recreational activity in the future, which may have minor, long-term adverse impacts to wildlife and marine and estuarine fauna (including protected species).

The FL TIG has completed technical assistance with relevant regulatory agencies related to potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status. Conservation measures recommended during consultation would be incorporated

into final project design and implementation to avoid and/or minimize adverse impacts to protected species and critical habitats. Specific conservation measures would also be implemented during construction to avoid and minimize disruption and overall adverse impacts to protected species. Below is a list of potential protected species at the project site, effects from the project activities, and potential conservation measures.

Sea turtles: Loggerhead, green, leatherback, hawksbill, and Kemp's ridley sea turtles could be present in the area. Turtle nesting typically occurs on Gulf side sandy beaches during the months of May through August, with hatching occurring from late July through October; it does not occur on the bay side where the project would be. There is potential for sea turtle encounters with private paddlecraft using the marina as turtles forage in the vicinity. However, paddlecraft are not anticipated to injure sea turtles if a collision occurs. If recommended during environmental compliance review, BMPs such as those identified within the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) and Measures for Reducing the Entrapment Risk to Protected Species (NMFS 2012) would be implemented and adhered to during periods of in-water work. Additionally, BMPs within the Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS 2008) would be implemented if recommended. Although fishing would occur from the Baars Park dock, the FL TIG anticipates minimal fishing interactions with sea turtles at this location due to the largely freshwater habitats upstream of Bayou Texar. As such, this project may have minor short- and long-term adverse impacts on sea turtles.

Giant manta ray. Giant manta rays inhabit a wide variety of nearshore and offshore productive marine habitats. Since Pensacola Bay is open to the Gulf where giant manta rays are known to occur, the species could be present in the Bay. Boat strikes and fishing gear entanglement are known causes of injury and mortality to giant manta rays. Since giant manta rays are highly mobile, they would likely avoid the area during construction. If recommended during environmental compliance review, BMPs would be implemented and adhered to during periods of in-water work. As a result of construction-related activities from these improvements, this project may have direct and/or indirect short-term minor adverse effects on the giant manta ray.

West Indian manatee and marine mammals. The project location does not intersect with any identified critical habitat for the West Indian manatee, but manatees could potentially be present in Pensacola Bay. Additionally, the Pensacola Bay/East Bay Stock of bottlenose dolphins could be present in the project area. Marine mammals are affected by vibrations and noise resulting from construction activities (e.g., generators, pile drivers). This project includes in-water work to install floating kayak launches at both parks and construct a fishing pier and dock at Baars Park. If recommended during environmental compliance review, the BMPs identified within the Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS 2008) and the Standard Manatee Conditions for In-water Work (USFWS 2011) would be implemented and adhered to during periods of in-water work. Additionally, mitigation measures to reduce adverse noise impacts to marine mammals, such as establishing a 25-meter shutdown zone around pile driving activities and using soft-start techniques when commencing pile driving, would be implemented. As a result of construction related activities from these improvements, this project may have minor short-term adverse effects on the West Indian manatee and other marine mammals.

Gulf sturgeon, Gulf sturgeon critical habitat, and smalltooth sawfish: There is critical habitat for Gulf sturgeon (Unit 9) in Pensacola Bay, and sturgeon are known to be in the bay and along the Gulf

shoreline. Smalltooth sawfish inhabit nearshore sandy substrate habitats and may be located in the action area. Potential adverse impacts to sturgeon and sawfish include elevated noise levels and the presence of suspended sediments in the water column due to construction related activities. However, sturgeon and sawfish are highly mobile and can avoid any disturbances in that area by swimming away. If recommended during environmental compliance review, standard BMPs such as those identified in the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) and Measures for Reducing the Entrapment Risk to Protected Species (NMFS 2012), would be followed. As a result of proposed construction activities, this project component may have direct or indirect short-term minor adverse effects on sturgeon, sturgeon critical habitat, and smalltooth sawfish.

Gopher tortoise. The gopher tortoise is a terrestrial turtle that occurs in well-drained sandy soils in sandhill, scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, and mixed hardwood pine habitats. Existing uplands at Baars Park include upland pine communities, providing potential habitat for gopher tortoises. Additionally, the species has been previously spotted in Pensacola. If any burrows or individuals are encountered in construction and staging areas, they would need to be relocated (after consulting with USFWS). As such, this project would have negligible to minor short-term adverse effects on the gopher tortoise.

Eastern indigo snake. The Eastern indigo snake inhabits a wide range of habitat types, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. It frequently co-inhabits gopher tortoise burrows; thus, the Eastern indigo snake would be subject to the same removal and relocation efforts as gopher tortoises if encountered. If recommended during environmental compliance review, BMPs described in the Standard Protection Measures for the Eastern Indigo Snake (USFWS 2013) would be implemented. Thus, this project may have negligible to minor short-term adverse effects on the Eastern indigo snake.

In summary, this project is anticipated to result in short- and long-term, minor to moderate adverse impacts to biological resources.

Socioeconomic Resources

During the construction phase of this project, construction equipment and operations would likely be located in previously disturbed areas and parking lots. To the extent required, the use of construction equipment, including equipment used for the movement and placement of materials and barriers enacted to protect public safety would result in some minor to moderate, short-term adverse impacts on aesthetics and visual quality. These impacts result from the presence of equipment, barriers, and construction-related dust and emissions. During the construction period, visible impediments would detract from the natural landscape and create visual contrast for observers. Short-term closures of public areas may be required to accommodate construction activities, which could adversely affect visitors.

From the public perspective, the site would be managed as it is at present, by the City of Pensacola. The proposed amenities at Baars Park would provide a new water-access site, and upgrades at Sanders Beach would improve a recreational site critically damaged by Hurricane Sally. Installing an ADA-accessible kayak launch would also increase water-based recreational opportunities for persons with limited mobility. The project would be expected to result in short-term increase in construction jobs.

In summary, the project is anticipated to result in short-term, minor adverse impacts to public health and safety, tourism and recreation, and aesthetics and visual resources. The project would also provide short-term economic benefits through employment opportunities as well as improvements to recreational amenities over the long-term.

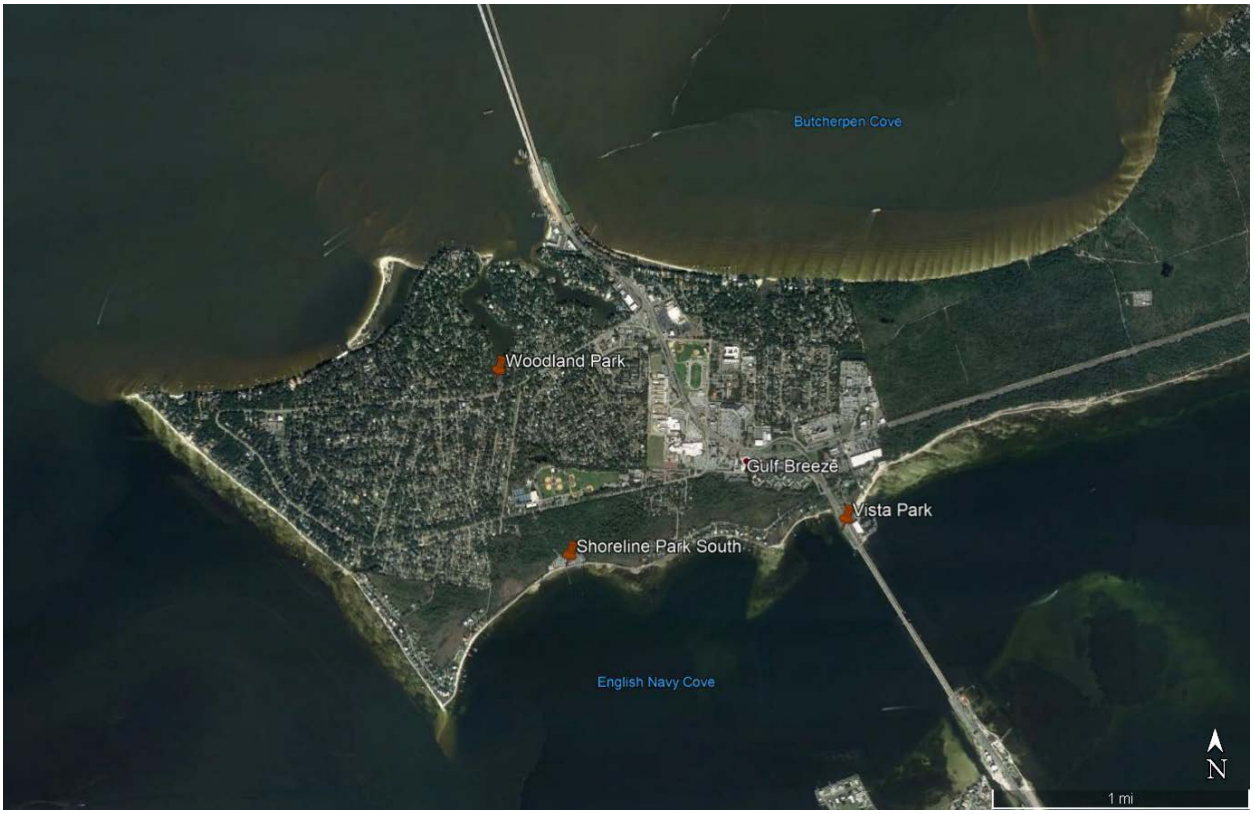
4.9.1.4 REC4[63], Gulf Breeze Parks Boating and Fishing Access Upgrades (Preferred)

The goal of the project is to increase recreational fishing opportunities for residents and tourists by renovating three of the City's existing parks (Shoreline Park South, Woodlands Park, and Vista Park; Figure 4-8). The project includes construction of new amenities and enhancement of existing amenities to increase access and improve visitors' overall fishing experiences. Activities most relevant to assessment of the environmental consequences of this project include:

- Enhancing Shoreline Park South by:
    - Demolishing the existing fishing pier (which was damaged by Hurricane Sally in September 2020) and constructing an expanded fishing pier in the same location to increase foot traffic and to accommodate the mooring of fishing vessels (4,950 square feet);
    - Renovating the existing boat launch (specifically making slope repairs above the waterline);
    - Constructing a new small vessel/fishing boat launch with a floating dock, fish-cleaning station, and refresh station for fisherman with ice, vending, and frozen bait machines;
    - Improving/enhancing parking, utilities, and security;
    - Installing additional monofilament recycling bins, if necessary;
- Enhancing Woodlands Park by:
    - Demolishing the existing dock/pier;
    - Constructing a new floating pier/gangway (8 feet wide by 60 feet long) with attached floating dock (16 feet wide by 26 feet long) and floating kayak launch;
    - Constructing a new ADA-compliant restroom facility;
    - Installing monofilament recycling bins;
    - Expanding parking and a concrete walk to connect the improvements to the existing facilities; and,
- Enhancing Vista Park by:
    - Constructing a new small vessel/fishing boat launch;
    - Installing a floating dock (16 feet wide by 26 feet long) connected to the shoreline;
    - Installing monofilament recycling bins; and,
    - Constructing a new concrete walk connecting the dock to the existing park.

[63] Environmental analysis for REC3, Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements is located in Section 4.4.1.

Figure 4-8 REC4, Gulf Breeze Parks Boating and Fishing Access Upgrades Park Locations in Gulf Breeze, Florida



Resources Analyzed in Detail for this Alternative

Table 4-17 identifies how potentially affected resources are analyzed for this alternative.

Table 4-17 NEPA Assessment of Resources for REC4

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.9.1.4
Hydrology and Water Quality	Analyzed in Section 4.9.1.4
Biological Resources	
Habitats	Analyzed in Section 4.9.1.4
Wildlife Species (including birds)	Analyzed in Section 4.9.1.4
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.9.1.4
Protected Species	Analyzed in Section 4.9.1.4
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.9.1.4
Aesthetics and Visual Resources	Analyzed in Section 4.9.1.4
Public Health and Safety	Analyzed in Section 4.9.1.4
Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

Affected Environment

This project would be implemented at three existing parks in Gulf Breeze: Woodland Park, Shoreline Park South, and Vista Park. All three parks contain upland, waterfront, and in-water areas. All three parks are currently developed and used for recreational purposes. The proposed improvements would occur in currently developed areas.

Woodland Park is located on a small bay that opens to the north shore of Gulf Breeze. Shoreline Park South and Vista Park are located on the south shore. Vista Park is located adjacent to the northwest end of Bob Sikes Bridge. The proposed alternative would add new recreational amenities to all three parks and enhance existing recreational infrastructure at Shoreline Park South.

Physical Resources

Gulf Breeze is located on the Florida Panhandle on the west end of Fairpoint Peninsula between Pensacola and Pensacola Beach. Woodland Park, Shoreline Park South, and Vista Park are predominantly flat, with soils classified as Kureb sand (0-8 percent slopes), Rutlege loamy sand, and Dorovan-Pamlico association (USDA-NRCS 2020). Construction equipment would be staged in each park's open or developed spaces near the project sites. Improvements would occur upland and in-water at all three parks.

Woodland Park is located adjacent to a small bay that opens to the north shore of Gulf Breeze and Pensacola Bay. Water depth in the bay adjacent to Woodland Park ranges from 2-4 feet. The portion of Pensacola Bay directly connected to the small bay is listed as a 303d impaired waterbody for nutrients (FDEP 2020d). Shoreline Park South and Vista Park are located on the south shore of Gulf Breeze, with waterfront along English Navy Cove which is an area between Santa Rosa Sound and Pensacola Bay, approximately 8 miles east of the Pensacola Bay Inlet. English Navy Cove is bound by Gulf Breeze to the

north, Pensacola Beach Barrier Island and the Fort Pickens Area of GUIS to the south, and the Pensacola Beach Road and the Bob Sikes Bridge to the east, which connects the Cove to Santa Rosa Sound. The Cove opens into Pensacola Bay to the west. Water depths in the Cove are generally shallow (less than 15 feet), except within the channel of the Intracoastal Waterway. There is a small area of wetlands within the footprint Shoreline Park South that overlaps with the existing fishing pier and boat launches (based on the most updated wetland assessment; USFWS 2018). Woodland Park is located in FEMA-Designated Flood Zone AE with a minimal flood elevation of 6 feet; Shoreline Park South and Vista Park are located in FEMA-designated Flood Zones AE and VE with a minimal flood elevation of 11-12 feet (FEMA 2020). All upland improvements at the three parks would be constructed in these flood zones.

Biological Resources

Woodland Park is a developed parcel that contains open, landscaped greenspace. Based on available information, there is no known SAV or federally designated EFH within the vicinity of Woodland Park (FWC 2018, NOAA 2018). Vista Park is a highly developed parcel alongside the Bob Sikes Bridge in Gulf Breeze with minimal landscaped greenspace. Based on available information, Vista Park is directly adjacent to patchy and discontinuous seagrass beds and is directly adjacent to EFH for coastal migratory pelagics, red drum, reef fish, and shrimp (FWC 2018, NOAA 2018).

Shoreline Park South is a partially developed parcel. Undeveloped portions of Shoreline Park South (which are located along the northern edge of the park) are a mixture of woody wetlands and grasslands/herbaceous areas (USGS 2016). Based on available information, Shoreline Park South contains patchy and continuous seagrass beds around the existing fishing pier and boat launches (FWC 2018). Additionally, in-water areas of Shoreline Park South overlap with EFH for coastal migratory pelagics, red drum, reef fish, and shrimp (NOAA 2018).

Fish and wildlife potentially present in and around the three parks include migratory birds, common terrestrial mammals (e.g., raccoons, opossums, squirrels), and select aquatic and terrestrial protected species. Migratory birds could potentially use Woodland Park or Shoreline Park South for nesting, foraging, roosting, and breeding. Potential migratory bird groups include wading birds, shorebirds (e.g., terns), raptors, and songbirds. There are no bald eagles known to be present at these sites (USFWS 2018). Although these bird species could occur around the parks, they are not known to inhabit or nest in the action area or in the nearby vicinity.

The current federal species list, as identified through IPaC, is summarized in Appendix E (USFWS 2018). There is no terrestrial critical habitat in the action area for the project. There is marine critical habitat for Gulf sturgeon in Pensacola Bay (Unit 9; NOAA OR&R, UNH, and USEPA 2018). The Pensacola Bay/East Bay Stock of common bottlenose dolphin and the West Indian manatee could be found in the action area (Hayes et al. 2020).

Socioeconomic Resources

Woodland Park, Shoreline South Park, and Vista Park are currently developed and used for recreational purposes. Woodland Park recreational amenities include picnic tables, playground equipment, park benches, a pier and dock, and parking. The area surrounding Woodland Park is primarily developed

residential neighborhood. Shoreline Park South currently includes a fishing pier, boat launches, covered picnic tables, pavilion, swimming area, bathrooms, paved walking paths, hiking trails, a dog park, parking, and utilities. The area surrounding Shoreline Park South is predominantly undeveloped evergreen forest and woody and emergent herbaceous wetlands. Vista Park currently includes a fishing pier and parking. The area surrounding Vista Park is highly developed land associated with the Bob Sikes Bridge to Pensacola Beach. The fishing piers at Shoreline Park South and Vista Park and the boat launches at Shoreline Park South were damaged by Hurricane Sally in September 2020. The three parks are owned by the City of Gulf Breeze and are free and open to the public.

Environmental Consequences

This proposed alternative would add recreational infrastructure at Woodland Park, Shoreline Park South, and Vista Park and enhance existing recreational infrastructure at Shoreline Park South. New in-water amenities at Woodland Park would primarily support paddlecraft, and the new amenities at Shoreline Park South and Vista Park would support small motorized watercraft.

Physical Resources

Implementation of this project could include use of heavy construction equipment, such as bulldozers, trucks, backhoes, tractor trailers, cranes, small excavators, forklifts, asphalt machine, roller, small power tools, generators, small trucks, and hand tools. Staging areas would be located on existing pavement or other developed terrestrial areas and by barge.

This project includes demolition of the dock/fishing pier, construction of a floating pier/gangway with an attached floating dock and floating kayak launch at Woodland Park; demolition and construction of an expanded fishing pier, addition of mooring docks to the fishing pier, repairs to the boat launches, and construction of a small vessel boat launch and dock at Shoreline Park South; and, construction of a new small vessel boat launch and floating dock at Vista Park. The overwater area of the amenities would be dependent upon final design, but for the purposes of this RP/EA, it is assumed to be approximately 950 square feet at Woodland Park, 5,500 square feet at Shoreline Park South, and 450 square feet at Vista Park. The floating dock at Woodland Park would be attached to the new floating pier/gangway (which would be anchored to land), and the floating dock at Vista Park would be anchored landward of the water line. Both of the floating docks would be used to put-in and take paddlecraft out of the water and require spars or guideposts to secure their location. For the purposes of this analysis, the FL TIG assumes no more than 10 guideposts would be installed. The spars or posts would be placed using the least invasive techniques (e.g., jetting, pushing, or driving the piles) where possible, but could use impact hammers, given substrate and construction cost considerations. The fishing pier at Shoreline Park South would use existing piling to the greatest extent possible, but some pilings may need to be replaced due to damage from Hurricane Sally (for the purposes of this analysis, the FL TIG assumes no more than 10 pilings would need to be replaced). Piling embedment depth would be subject to final design. If piles need to be replaced, they would be placed using the least invasive techniques (e.g., jetting, pushing, or driving the piles) where possible, but could use impact hammers, given substrate and construction-cost considerations. In-water dredging or digging associated with installation of the pilings for the pier and dock at Shoreline Park South is not anticipated, though substrate displacement and compaction from

piling installation may occur. The proposed pier replacement, new docks, and new kayak launch would be ADA compliant.

Digging would occur in the terrestrial environment for the pier/gangway anchor, parking, and walkways at Woodland Park, for the boat launch repair, new boat launch, and enhanced parking at Shoreline Park South, and for the new boat launch, boat dock anchor, and walkways at Vista Park. Cumulatively, digging could occur over approximately 2.5 acres (estimated for the purposes of this RP/EA) for these elements. Digging and soil disturbance is proposed for areas of these parks that have previously been disturbed or developed. Construction and digging activities, including staging areas for construction equipment, would utilize existing development footprints and disturbed areas, but digging and staging equipment could disturb some soils. Terrestrial work that may affect hydrology and water quality includes construction of additional impervious surfaces such as the expansion of paved parking lots at Woodland Park and Shoreline Park South and concrete walkways at Woodland Park and Vista Park. In-water activities can temporarily negatively impact water quality by increasing turbidity. The proposed fish cleaning station at Shoreline Park South would be connected to the municipal sewage line, providing long-term benefits to water quality.

Specific mitigation measures such as erosion-control plans and silt curtains would be implemented during construction to minimize erosion and overall adverse substrate impacts. Construction involving substrate compaction, displacement, and erosion would have short- and long-term minor adverse impacts on geology and substrates. This project would result in minor short- as well as long-term adverse impacts on water quality and hydrology due to increased sedimentation, impervious surfaces, and potential vessel-based pollution from recreators.

In summary, the project would have short- and long-term minor adverse impacts to physical resources.

Biological Resources

The additions to all three parks would occur in previously developed or disturbed upland and in-water habitats. The improvements would utilize existing infrastructure where possible, such as existing pier pilings at Shoreline Park South. In-water and terrestrial improvements would avoid wetlands to the extent practical and feasible and are subject to regulatory consultations depending on the final design. Wetlands are present along the shore at Shoreline Park South that have previously been disturbed by the existing fishing pier and boat launch. Any work in waters of the U.S., including wetlands, associated with this alternative would be coordinated with the USACE pursuant to Section 404 of the CWA. Coordination with the USACE and final authorization pursuant to CWA/RHA would be completed prior to final design and construction. USACE and NMFS construction guidelines regarding pier and dock construction would be followed where possible (USACE/NMFS 2001), and final placement and design would include considerations for ADA compliance.

Construction activities in-water and on land associated with this alternative could result in moderate, short-term adverse impacts to aquatic habitat due to erosion and increased turbidity during construction. The release of sediments during in-water and terrestrial construction would be controlled using BMPs and mitigation to protect aquatic habitats, prevent the transport of sediment into

waterways, confine adverse impacts to construction sites, and minimize the magnitude of adverse impacts on water quality in English Navy Cove and the small bay adjacent to Woodland Park.

In-water and terrestrial improvements would avoid wetlands to the extent practical and feasible and are subject to regulatory consultations pending the final design. There is in-water work proposed for this alternative at all three parks for: the floating pier, dock, and kayak launch construction at Woodland Park; fishing pier, mooring dock, and boat launch construction at Shoreline Park South; and boat launch and floating dock construction at Vista Park. Additionally, some pilings (specifically for the expanded fishing pier at Shoreline Park South) may be required if the existing pilings were significantly damaged by Hurricane Sally. Where possible, piles would be installed using the least invasive techniques (e.g., jetting, pushing, driving), but could use impact hammers given substrate and construction cost considerations. Patchy and continuous seagrass is present at Shoreline Park South and is adjacent to Vista Park (FWC 2018).

A benthic survey would be completed between June 1 and September 30 to determine whether the proposed activities would result in adverse impacts to SAV and EFH. If the post-construction SAV survey determines that there were unanticipated adverse impacts resulting from construction-related activities at Shoreline Park South or Vista Park, then a functional assessment would be conducted to determine if appropriate in-kind mitigation should be developed and implemented. Specific conservation and mitigation measures would be implemented during the finalization of engineering and design plans and construction to minimize erosion and overall adverse habitat impacts.

Construction equipment and staging areas could negatively impact habitat, but as noted previously, these would be sited on existing development footprints where possible to minimize impacts. Although the proposed improvements could negatively impact habitats and biological resources (e.g., clearing of vegetation for parking at Woodlands Park or new walkways at Woodlands Park and Vista Park), most of the improvements are proposed for currently disturbed areas and landscaped areas. Implementation activities would have moderate, short-term adverse impacts to habitats. Long-term adverse habitat impacts are anticipated to be minor since the recreational amenities would be constructed at existing disturbed sites.

The new recreational amenities at Woodland Park, Shoreline Park South, and Vista Park would be used for fishing purposes and would be publicly accessible. The number of anglers is unknown and would vary with site visitation and fishing season. All three parks currently support recreational fishing, and project amenities are not anticipated to increasing fishing pressure on target recreational species. Monofilament recycling bins would be installed as part of the project to reduce the risk of entanglement to protected species. If recommended during environmental compliance review, BMPs to reduce fishing adverse impacts on protected species, such as reporting incidental hook and line captures of listed species and posting educational signage posted to inform anglers about how to respond to incidental hooking events would be implemented. While the public is currently able to access the three Gulf Breeze parks for recreational purposes, improved amenities may result in a higher level of recreational activity in the future, which may have minor to moderate, long-term impacts to wildlife and marine and estuarine fauna (including protected species).

The FL TIG has completed technical assistance with relevant regulatory agencies related to potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status. Conservation measures recommended during consultation would be incorporated into final project design and implementation to avoid and/or minimize adverse impacts to protected species and critical habitats. Specific conservation measures would also be implemented during construction to avoid and minimize disruption and overall adverse impacts to protected species. Below is a list of potential protected species at the project site, effects from the project activities, and potential conservation measures.

Sea turtles: Loggerhead, green, leatherback, hawksbill, and Kemp's ridley sea turtles could be present in the area. Turtle nesting typically occurs on Gulf side sandy beaches during the months of May through August, with hatching occurring from late July through October; it does not occur on the bay side where the project would be. There is potential for sea turtle encounters with private motorized vessels and paddlecraft using boat launches and docks as turtles forage in the vicinity. However, the increase in boating activity and watercraft collisions with sea turtles in the bay should be negligible. If recommended during environmental compliance review, BMPs such as those identified within the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) and Measures for Reducing the Entrapment Risk to Protected Species (NMFS 2012) would be implemented and adhered to during periods of in-water work. Additionally, BMPs within the Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS 2008) would be implemented if recommended. Due to potential recreational fishery interactions at the three parks, this project may have moderate short- and long-term adverse impacts on sea turtles.

West Indian manatee and marine mammals. The project location does not intersect with any identified critical habitat for the West Indian manatee, but manatees could potentially be present in Pensacola Bay. Additionally, the Pensacola Bay/East Bay Stock of bottlenose dolphins could be present in the project area. Marine mammals are affected by vibrations and noise resulting from construction activities (e.g., generators, pile drivers). This project includes in-water work for the installation of a floating dock and kayak launch at Woodland Park, construction of a new fishing pier with mooring docks and a new boat launch and docks at Shoreline Park South, and construction of a new boat launch and floating dock at Vista Park. If recommended during environmental compliance review, the BMPs identified within the Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS 2008) and the Standard Manatee Conditions for In-water Work (USFWS 2011) would be implemented and adhered to during periods of in-water work. Additionally, mitigation measures to reduce adverse noise impacts to marine mammals, such as establishing a 25-meter shutdown zone around pile driving activities and using soft-start techniques when commencing pile driving, would be implemented. As a result of construction related activities from these improvements, this project may have short-term minor adverse effects on the West Indian manatee and other marine mammals.

Giant manta ray. Giant manta rays inhabit a wide variety of nearshore and offshore productive marine habitats. Since Pensacola Bay is open to the Gulf where giant manta rays are known to occur, the species could be present in the Bay. Boat strikes and fishing gear entanglement are known causes of injury and mortality to giant manta rays. Since giant manta rays are highly mobile, they would likely

avoid the area during construction. If recommended during environmental compliance review,, BMPs would be implemented and adhered to during periods of in-water work. As a result of construction-related activities from these improvements, this project may have direct and/or indirect short-term minor adverse effects on the giant manta ray.

Gulf sturgeon, Gulf sturgeon critical habitat, and smalltooth sawfish: There is critical habitat for Gulf sturgeon (Unit 9) in Pensacola Bay, and sturgeon are known to be in the bay and along the Gulf shoreline. Smalltooth sawfish inhabit nearshore sandy substrate habitats and may be located in the action area. Potential adverse impacts to sturgeon and sawfish include elevated noise levels and the presence of suspended sediments in the water column due to construction related activities. However, sturgeon and sawfish are highly mobile and can avoid any disturbances in that area by swimming away. If recommended during environmental compliance review, standard BMPs such as those identified in the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) would be followed. As a result of proposed construction activities, this project may have short-term minor adverse effects on sturgeon, sturgeon critical habitat, and smalltooth sawfish.

Gopher tortoise. The gopher tortoise is a terrestrial turtle that occurs in well-drained sandy soils in sandhill, scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, and mixed hardwood pine habitats. Existing uplands at Woodlands Park and Shoreline Park South include vegetated habitats that could provide potential habitat for gopher tortoises. Additionally, the species has been previously spotted in Gulf Breeze. If any burrows or individuals are encountered in construction and staging areas, they may be relocated (after consulting with USFWS). As such, this project may have minor short-term adverse effects to gopher tortoises.

In summary, this project is anticipated to result in short- and long-term, minor to moderate, adverse impacts to biological resources. A biological assessment is being prepared to evaluate this project's adverse impacts on protected species.

Socioeconomic Resources

During the construction phase of this project, equipment and operations would likely be located in previously disturbed areas and parking lots. To the extent required, the use of construction equipment, including equipment used for the movement and placement of materials and barriers enacted to protect public safety would result in some minor to moderate, short-term adverse impacts on aesthetics and visual quality. These impacts result from the presence of equipment, barriers and construction-related dust and emissions. During the construction period, visible impediments would detract from the natural landscape and create visual contrast for observers. Short-term closures of public areas may be required to accommodate construction activities, which could adversely affect visitors.

From the public perspective, the site would be managed as it is at present, by the City of Gulf Breeze. The proposed amenities at Vista Park would provide new water access sites, and upgrades at Shoreline Park South and Vista Park would improve recreational sites critically damaged by Hurricane Sally. Installing an ADA-accessible kayak launch at Woodland Park would also increase water-based

recreational opportunities for persons with limited mobility. The project would be expected to result in short-term increase in construction jobs.

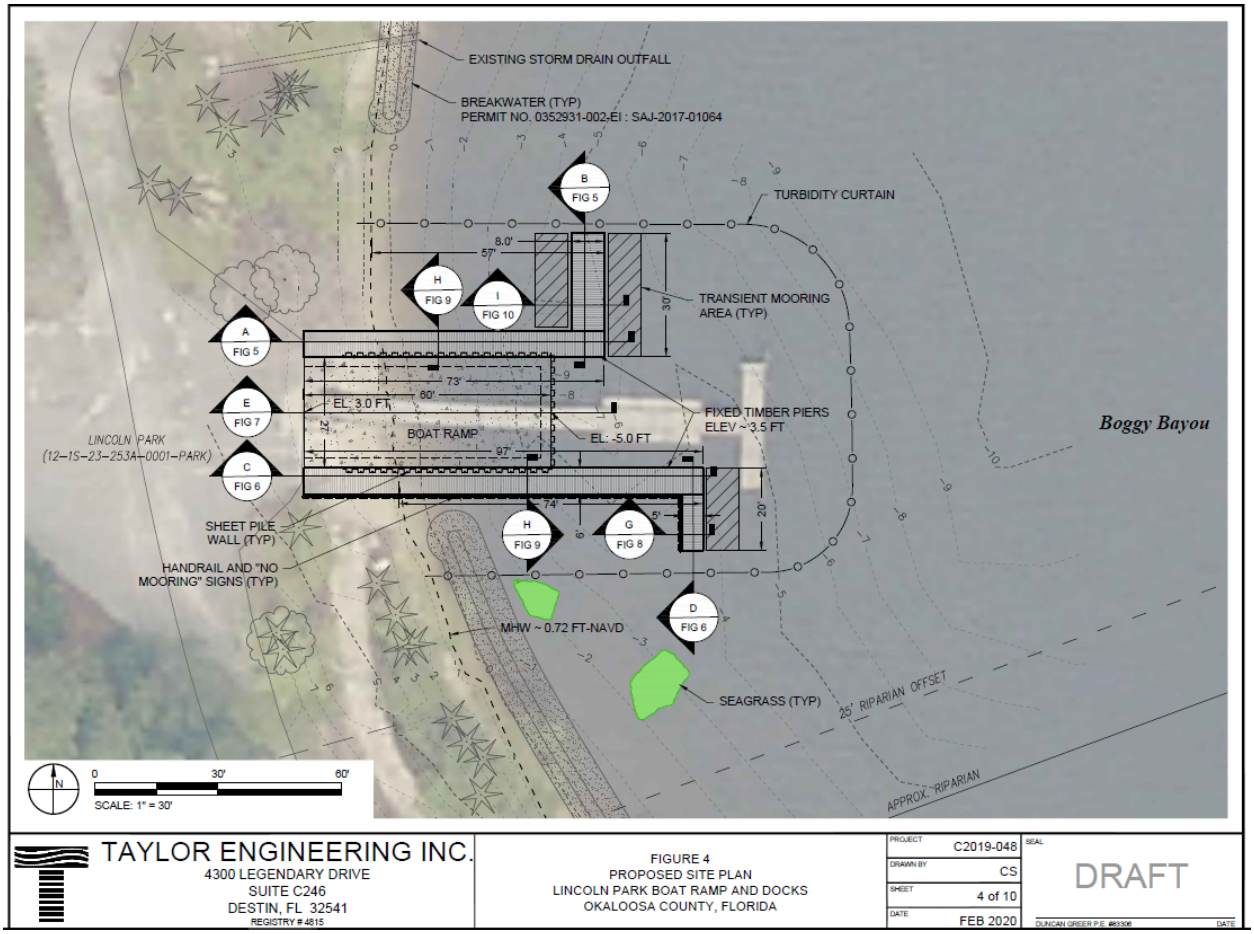
In summary, the project is anticipated to result in short-term, minor adverse impacts to public health and safety, tourism and recreation, and aesthetics and visual resources. The project improvements would also provide short-term economic benefits through employment opportunities as well as improvements to recreational opportunities over the long-term.

4.9.2 REC5, Lincoln Park Boat Ramp and Dock Improvements (Preferred)

The goal of this project is to enhance recreational fishing experiences at Lincoln Park by improving existing recreational infrastructure and water access sites. Activities most relevant to assessment of the environmental consequences of this project include:

- Demolishing two existing single-lane boat ramps (approximately 1,191 square feet) and constructing one new re-designed two-lane boat ramp in the same location (approximately 1,500 square feet; Figure 4-9);
- Incorporating sheet pile into the new boat ramp for increased resiliency and design-life to reduce potential for scour at the ramp toe and siltation along the nearshore portion of the ramp;
- Installing approximately three concrete piles to support the waterward end of the slab (if determined to be required during design);
- Demolishing the existing central pier (approximately 710 square feet) and constructing two new flanking access docks (approximately 1,072 square feet);
- Repairing and expanding the existing unpaved gravel parking lot by creating 11 additional gravel parking spaces; and
- Installing monofilament recycling bins.

Figure 4-9 Conceptual drawings for the boat ramp and dock at Lincoln Park



4.9.2.1 Resources Analyzed in Detail for this Alternative

Table 4-18 identifies how potentially affected resources are analyzed for this alternative.

Table 4-18 NEPA Assessment of Resources for REC5

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.9.2.1
Hydrology and Water Quality	Analyzed in Section 4.9.2.1
Biological Resources	
Habitats	Analyzed in Section 4.9.2.1
Wildlife Species (including birds)	Analyzed in Section 4.9.2.1
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.9.2.1
Protected Species	Analyzed in Section 4.9.2.1
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.9.2.1
Aesthetics and Visual Resources	Analyzed in Section 4.9.2.1
Public Health and Safety	Analyzed in Section 4.9.2.1
Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.9.2.2 Affected Environment

This proposed project includes recreational improvements at an existing park, Lincoln Park, in Valparaiso, Florida.

Physical Resources

Lincoln Park is located east of North Bayshore Drive along Boggy Bayou in the greater Choctawhatchee Bay area. The park is predominantly flat with poorly drained, siliceous soils and fine sands. Soils at the site have been classified as Chipley and Hurricane soils (0-5 percent slopes) and Lakeland sands (5-12 percent slopes) (USDA-NRCS 2020). Construction equipment would be staged in existing disturbed or develop areas. Improvements would occur upland and in-water.

The park is located along Boggy Bayou, an estuary of Choctawhatchee Bay that is fed by Turkey Creek. Water flows south through Boggy Bayou to Choctawhatchee Bay, then into the Gulf. Water depths in Boggy Bayou are shallow (approximately 1-2 feet) along the shore and increase to a maximum of approximately 15 feet deep in the main center channel. In-water project construction activities for the new boat ramp would occur in waters up to 9 feet deep. Boggy Bayou is listed as a 303d impaired waterbody for nutrients (chlorophyll-a and total nitrogen) and bacteria (FDEP 2020d). Boggy Bayou is tidally influenced, with the park experiencing approximately one-half inch change in water level between MHW and MLW. In-water work would overlap designated marine and estuarine deepwaters (USGS 2016). The park sits within FEMA-designated Flood Zone AE, with flood elevations of 7-8 feet (FEMA 2020). Upland recreational improvements would occur within this flood zone.

Biological Resources

Lincoln Park includes upland habitat with a mixture of open space to medium-intensity developed areas (USGS 2016). Habitats include grasses, shrubs, and trees throughout the park. Proposed recreational improvements would be located in areas that are previously disturbed and developed.

Preliminary seagrass delineation for design and permitting was completed at the project site on August 30, 2019 (as described in FDEP permit number 0352931-004-EI/46; FDEP 2020b). Seagrass was found approximately 15 feet south of the existing boat ramp. The project site also overlaps with designated EFH for coastal migratory pelagics, red drum, reef fish, and shrimp (NOAA 2018). The Choctawhatchee Bay Stock of bottlenose dolphins (Hayes et al. 2020) and the West Indian manatee could be present in the project area. Bald eagles may also be present in the proposed project area. The current federal species list, as identified through IPaC, is summarized in Appendix E (USFWS 2018).

Socioeconomic Resources

Okaloosa County has a total population of 210,738 people, an increase of 16.5 percent since 2010, based on the 2019 U.S. Census. Approximately 81.1 percent of the county population are white, 10.5 percent are black or African American, and about 9.7 percent are Hispanic or Latino. The remaining population includes small percentages of American Indian, Asian, and Pacific Islander. Median household income reported in 2019 in the County was $64,048 and the percent of the county residents in poverty accounted for 12.7 percent of the population. Most of the county residents (91.8 percent) are high school graduates or higher. The county unemployment rate was 4.5 percent in 2020.

Lincoln Park is a city park that is free to the public. The park has existing recreational infrastructure including a swimming area with docks, picnic area, restrooms, showers, playgrounds, boat ramp, and parking areas. The existing boat ramp, one of the docks, and the parking lot would be replaced as part of this project.

4.9.2.3 Environmental Consequences

Physical Resources

Implementation of this project could include use of heavy construction equipment to demolish the existing boat ramps, construct the new two-lane boat ramp, incorporate sheet pile, install concrete piles, demolish the existing pier, construct new docks, and repair and expand the gravel parking area. Equipment could include front-end loaders, back hoes, skid steers, augers, pavement cutters, large jackhammers, dump trucks, concrete trucks, vehicle and material delivery trucks and trailers, light-duty work trucks, generators, port-a-johns, a construction trailer, and a variety of power tools.

In-water work is proposed for the removal of the two existing boat ramps and the existing central pier, and construction of the new boat ramp and flanking docks in the same location. Construction equipment such as a backhoe with a long arm and bucket, located on shore near the MLW line, may be used. The overwater structures include the two fixed access docks on either side of the boat ramp. The boat ramp would be oriented to the east, perpendicular to the shoreline at Lincoln Park. The two flanking access docks would run parallel to the boat ramp, oriented to the east. The northern dock would be shorter, extending approximately 54 feet from the MHW line. The longer, southern dock would extend approximately 74 feet from the MHW line. The overwater area for the new boat ramp and docks are dependent upon final design. For the purposes of this RP/EA, the ramp is assumed to cover approximately 1,500 square feet (an increase of approximately 309 square feet over the existing boat ramps) and the access docks are assumed to cover approximately 1,072 square feet (an increase of approximately 362 square feet over the existing area). No more than 32 in-water piles are anticipated, approximately 12-14 inches in diameter each. Piling installation would use the least invasive techniques (e.g., jetting, pushing, or driving the piles) where possible, but impact hammers could be used based on substrate and construction cost considerations. A minor amount of underwater excavation would be

done to remove the existing concrete boat ramps. Additionally, the new sheet piling to support the boat ramp could be installed to act as a cofferdam (although the primary purpose is to reduce potential for long-term destabilization of the foundation). The exact method of construction is unknown at this time and could involve the use of boats or barges.

Digging would also occur in the terrestrial environment for the boat ramp and docks and to repair and expand the existing unpaved gravel parking lot. Terrestrial work would also affect hydrology and water quality during construction. However, staging areas would be located on existing pavement or other heavily developed areas as much as possible. Specific mitigation measures would be implemented during construction to minimize erosion and overall adverse soil impacts. A turbidity barrier/curtain would be used during demolition and construction activities. BMPs and boom placement along with other avoidance and mitigation measures required by state and federal regulatory agencies would be employed to minimize any adverse water quality and sedimentation impacts. Increased use of the area due to recreational improvements including additional parking, could disturb sediments and soils in the long-term and increase turbidity.

In summary, the project is anticipated to result in minor to moderate, short- and long-term, adverse impacts to physical resources.

Biological Resources

The proposed boat ramp, flanking docks, and parking lot would be constructed in disturbed marine and terrestrial habitats. Where possible, staging and access would occur in areas that are developed and disturbed with minimal vegetation. This project has been permitted by the USACE pursuant to Section 404 of the CWA regarding adverse wetland impacts. As required by the USACE permit, the project would follow PDC for pile-supported structures and boat ramps as outlined in JAXBO (PDC AP. 1-14, A2.1-9, S.1-2, A6.1-6; NMFS 2017) to minimize adverse impacts to marine habitats and species.

Terrestrial and in-water demolition and construction activities could have short-term, moderate adverse impacts to terrestrial and aquatic habitats. Specific conservation measures would be implemented during the finalization of engineering and design plans and construction to minimize erosion, habitat fragmentation, runoff, adverse protected species impacts, and overall adverse habitat impacts. The release of sediments during construction would be controlled using BMPs and mitigation measures to prevent transport of sediment into waterways, confine adverse impacts to construction sites, and minimize the magnitude of adverse impacts on aquatic habitats. Further, as noted above, to the extent possible, staging areas and other operations would occur on previously disturbed areas. Pilings and sheetpiling would be installed to support the dock and boat ramp. Where possible, piles would be installed using the least invasive techniques (e.g., jetting, pushing, driving), but could use impact hammers given substrate and construction cost considerations.

In-water work could negatively impact SAV in Boggy Bayou off the project site due to construction activities, increased turbidity and sedimentation, and the increase in over-water area of the new boat ramp and docks. However, the boat ramp would be sited and designed to minimize adverse impacts and is unlikely to negatively impact more than 0.02 acres of SAV. Dock decking would be made from treated timber and spaced appropriately to allow light through to the seafloor. Additionally, in-water construction would use a turbidity curtain to maintain water quality and reduce adverse impacts to nearby seagrass beds. An SAV survey would be completed prior to any construction activities, and if possible, the SAV survey would be conducted between June 1 and September 30. If SAV was found

during the pre-construction survey, a post-construction SAV survey would also be conducted. If the post-construction survey determines that there were unanticipated adverse impacts resulting from demolition and construction of the ramp, then a functional assessment would be conducted to determine if appropriate in-kind mitigation should be developed and implemented.

The overall footprint of the project would be similar to current conditions, and therefore long-term adverse impacts to habitats would be minor. However, the proposed recreational improvements, including the boat ramp and increased parking, could result in an increase in visitors. Increased visitors could negatively impact wildlife and habitat due to increased noise and human activity, including a potential increase in boats in the area. These adverse impacts are anticipated to be minor and not significantly different than the current conditions at the park. Although recreational fishing activity may increase due to the improvements, monofilament recycling bins would be placed at the project site to reduce adverse impacts of fishing gear on protected species. Educational signage could also be posted to inform anglers about how to report entangled or trapped protected species, as well as warn anglers about protected species potentially present in the area.

The FL TIG has completed technical assistance with relevant regulatory agencies related to potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status. ESA consultation for species under NMFS purview is complete per the JAXBO which is part of the USACE permitting process (NMFS 2017). Conservation measures recommended during consultation or required by permits would be incorporated into final project design and implementation to avoid and/or minimize adverse impacts to protected species and critical habitats. Specific conservation measures could also be implemented during construction to avoid and minimize disruption and overall adverse impacts to protected species. Below is a list of potential protected species at the project site, effects from the project activities, and potential conservation measures.

Marine fish and reptiles: Adverse impacts to loggerhead turtle, green turtle, Kemp's ridley turtle, Gulf sturgeon, and smalltooth sawfish are accounted for under JAXBO. This project would adhere to PDC required for USACE-permitted projects, for in-water activities, and for pile-supported structures and anchored buoys, which include but are not limited to: education and observation of potential protected species in the project site; reporting interactions with protected species; turbidity control measures; and, entanglement avoidance measures. As determined in JAXBO, this project may have minor to moderate short- and long-term adverse impacts on sea turtles, Gulf sturgeon, and smalltooth sawfish.

Giant manta ray. Giant manta rays inhabit a wide variety of nearshore and offshore productive marine habitats. Since Choctawhatchee Bay is open to the Gulf where giant manta rays are known to occur, the species could be present in the Bay. Boat strikes and fishing gear entanglement are known causes of injury and mortality to giant manta rays. Since giant manta rays are highly mobile, they would likely avoid the area during construction. If recommended during environmental compliance review, BMPs would be implemented and adhered to during periods of in-water work. As a result of construction-related activities from these improvements, this project may have direct and/or indirect short-term minor adverse effects on the giant manta ray.

West Indian manatee and marine mammals: The West Indian manatee inhabits freshwater, brackish, and marine environments. It typically occurs in coastal and inland tidal rivers and streams, mangrove swamps, salt marshes, freshwater springs, canals, lagoons, and vegetated bottoms. It moves to warm-water sites, including industrial warm-water discharges, during the winter. The project location does not

intersect with any identified critical habitat for the West Indian manatee, but they could potentially be present in the project area. Additionally, the Choctawhatchee Bay Stock of bottlenose dolphins could be present in the project area. Marine mammals are affected by vibrations and noise resulting from construction activities (e.g., generators, pile drivers). This project includes in-water work for the construction of a boat dock and launch. If recommended during environmental compliance review, the BMPs identified within the Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS 2008) and the Standard Manatee Conditions for In-water Work (USFWS 2011) would be implemented and adhered to during periods of in-water work. Additionally, mitigation measures to reduce adverse noise impacts to marine mammals, such as establishing a 25-meter shutdown zone around pile driving activities and using soft-start techniques when commencing pile driving, would be implemented. As a result of construction-related activities from these improvements, this project may have minor short-term adverse effects on the West Indian manatee and other marine mammals

Gopher tortoise: The gopher tortoise is a terrestrial turtle that occurs in well-drained sandy soils in sandhill, scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, and mixed hardwood pine habitats. Existing uplands at this site include sandy soils, providing potential habitat for the gopher tortoise, which have been previously spotted in the vicinity. If any burrows or individuals are encountered in construction and staging areas, they may need to be relocated (after consulting with USFWS). As such, this project would have negligible to minor short-term adverse impacts to gopher tortoises.

Eastern indigo snake: The Eastern indigo snake inhabits a wide range of habitat types, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. It frequently co-inhabits gopher tortoise burrows; thus, the Eastern indigo snake would be subject to the same removal and relocation efforts if encountered. If recommended during environmental compliance review, the BMPs identified within the Standard Protection Measures for the Eastern Indigo Snake (USFWS 2013) would be implemented and adhered to during construction. Thus, this project may have negligible to minor short-term adverse impacts to Eastern indigo snakes.

Wood stork: The wood stork prefers to nest and forage in cypress swamps and marshes and has been documented nesting in the greater Choctawhatchee area. Wood stork colonies are not known to be near the project area, but individual birds could be present in the action area. If recommended during environmental compliance review, the BMPs identified within the Habitat Management Guidelines for the Wood Stork in the Southeast Region (USFWS 1990) would be implemented. As such, this project may have negligible to minor short-term adverse impacts to wood stork.

In summary, this project is anticipated to result in short- and long-term, minor to moderate, adverse impacts to biological resources.

Socioeconomic Resources

This project would enhance public recreation and access to natural resources at Lincoln Park. During construction (including demolition), adverse impacts would mostly be on visitor-use experience since parts of the area would be inaccessible to visitors. The use of construction equipment and barriers enacted to protect public safety during construction would result in minor to moderate, short-term adverse impacts on recreational uses of the site as well as aesthetics and visual quality. During the

construction period, visible impediments would detract from the natural landscape and create visual contrast for observers.

However, this project would also provide benefits to socioeconomic resources. The current boat ramp and pier pose a public safety hazard from deterioration; replacing the aging structures would provide the public with safe recreational experiences. This project would be expected to result in a short-term increase in construction jobs. The new boat ramp would be open to the public with no fees for use and the additional parking spaces would provide enhanced access.

In summary, this project is anticipated to result in minor, short-term adverse impacts, as well as short- and long-term benefits to socioeconomic resources.

4.9.3 REC7, St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass[64]

The goal of the project is to enhance a 10-15-acre parcel at Indian Pass for recreational opportunities. The parcel would be acquired under the proposed FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass project. Activities most relevant to assessment of the environmental consequences of this project include:

- Removing the existing single-lane boat ramp;
- Constructing a new double-lane boat ramp west of the old boat ramp location, including creating a small lagoon,
- Increasing vehicle/trailer unpaved parking from approximately 14 to 31 spaces;
- Adding monofilament fishing line recycling bins; and,
- Constructing a trail system, picnic areas, and an observation deck.

4.9.3.1 Resources Analyzed in Detail for this Alternative

Table 4-19 identifies how potentially affected resources are analyzed for this alternative.

[64] The NEPA assessment for FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass is addressed in Section 4.5.2.

Table 4-19 NEPA Assessment of Resources for REC7

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.9.3.1
Hydrology and Water Quality	Analyzed in Section 4.9.3.1
Biological Resources	
Habitats	Analyzed in Section 4.9.3.1
Wildlife Species (including birds)	Analyzed in Section 4.9.3.1
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.9.3.1
Protected Species	Analyzed in Section 4.9.3.1
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.9.3.1
Aesthetics and Visual Resources	Analyzed in Section 4.9.3.1
Public Health and Safety	Analyzed in Section 4.9.3.1
Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.9.3.2 Affected Environment

The affected environment for this project is very similar to that described for FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass (Section 4.5.2.2). The only difference is that this project proposes in-water work with the removal of a single-lane boat ramp and the construction of a double-lane boat ramp. As such, affected biological resources in the marine environment are described below. See Section 4.5.2.2 for a description of physical and socioeconomic resources in the affected environment.

Biological Resources

Estuarine and marine wetland habitat occurs in the surrounding Indian Lagoon, Indian Pass, and Gulf which could overlap with construction for recreational improvements. There are also patchy SAV beds north and west of the parcel (FWC 2018), but these are not anticipated to overlap with any project activities. The St. Vincent Sound/Apalachicola Bay/St. George Sound Stocks and Gulf of Mexico Northern Coastal Stock of bottlenose dolphins (Hayes et al. 2020) as well as West Indian manatees could be present in the project area. The Indian Lagoon and Indian Pass areas are categorized as Bottlenose Dolphin Biologically Important Areas (Van Parijs, Curtice, and Ferguson 2015). The project site also overlaps with federally designated EFH for coastal migratory pelagics, red drum, reef fish, and shrimp (NOAA 2018).

The current federal species list, as identified through IPaC, is summarized in Appendix E (USFWS 2018).

4.9.3.3 Environmental Consequences

Physical Resources

Implementation of this project could include use of heavy construction equipment to remove the existing single-lane boat ramp and construct new recreational amenities (double-lane boat ramp, small lagoon, unpaved parking spaces, trail system, picnic areas, and observation deck). Equipment could

include bulldozers, trucks, construction trailers, backhoes, tractor trailers, cranes, small excavators, forklifts, generators, augers, and a variety of power tools.

In-water work is proposed for the removal of the existing boat ramp and construction of the new boat ramp. The overwater area for the new boat ramp is dependent upon final design, for the purposes of this RP/EA, the ramp is assumed to cover approximately 4,000 square feet. No more than 20 in-water wooden or concrete piles with a 12-inch diameter or less are anticipated, and piling installation would use the least invasive techniques (e.g., jetting, pushing, or driving the piles) where possible. Substrate displacement for possible pilings would be less than 20 square feet. A minor amount of underwater excavation would be done to remove the existing boat ramp. The exact method of construction is unknown at this time and may involve the use of boats or barges. Construction equipment such as a backhoe with a long arm and bucket, located on shore near MLW line, may be used to remove and install materials. Depth of removal from the shallow benthos is approximately 0-3 feet. Sand and material removed would be placed above the surf line where the material would be removed and disposed of or returned back into the spot it came from as best as possible. During construction, BMPs and boom placement along with other avoidance and mitigation measures required by state and federal regulatory agencies would be employed to minimize any water quality and adverse sedimentation impacts. Increased use of the boat ramp, due to the addition of a double-lane ramp and additional parking spaces, could disturb sediments and soils in the long-term, potentially increasing turbidity.

Digging and construction would also occur in the terrestrial environment for the boat ramp, additional unpaved parking spaces, trail system, picnic areas, and observation deck. Construction and digging activities, including staging areas for construction equipment, would utilize existing development footprints and disturbed areas where possible (e.g., existing roads, paved areas), but digging and staging equipment would disturb some soils. The area of disturbed soils for each recreational improvement is unknown at this time and would be dependent upon final designs. Construction vehicles would enter the site from the nearby highway. Although development of the trail system, picnic areas, and observation deck would negatively impact soils and possibly cause adverse impacts to hydrology and water quality due to runoff, erosion, and increased turbidity, the improved infrastructure would help to concentrate foot traffic and reduce dispersed adverse impacts to soils in the long-term.

Mitigation measures would be implemented during construction to minimize erosion and overall soil adverse impacts. Construction involving ground disturbances from proposed improvements and site-preparation activities would have minor to moderate, short- and long-term adverse impacts on geology and substrates. This project would result in short-term, minor to moderate adverse impacts on water quality and hydrology due to the construction of the improvements.

In summary, the project is anticipated to result in short- and long-term, minor to moderate adverse impacts to physical resources.

Biological Resources

Terrestrial and in-water construction activities could have short-term, moderate adverse impacts on aquatic and terrestrial habitats due to erosion, noise, and increased turbidity during construction. Construction could involve the use of heavy machinery to demolish the existing boat ramp, construct a new boat ramp, and construct the trail system, picnic area, and observation deck. The release of sediments during in-water and terrestrial construction would be controlled using BMPs and mitigation to protect aquatic habitat, prevent the transport of sediment into waterways, confine adverse impacts

to construction sites, and minimize the magnitude of adverse impacts on aquatic habitats in Indian Pass and Indian Lagoon which provide high-quality natural fish and wildlife habitat.

In-water and terrestrial improvements would avoid wetlands to the extent practical and feasible and are subject to regulatory consultations depending on final designs. Conservation and mitigation measures would be implemented during the finalization of E&D plans and construction to minimize erosion and overall adverse habitat impacts. Construction equipment and staging areas could negatively impact habitat, but as noted previously, these would be sited on existing development footprints, where possible, to minimize impacts. Although the improvements could potentially negatively impact habitats and biological resources (e.g., clearing of vegetation, shoreline development), the trail system, picnic area, and observation deck would concentrate human activity and reduce adverse impacts to habitats in the area over the long-term. Since some habitat may be developed for recreational purposes, this project would have moderate, long-term adverse impacts to terrestrial and aquatic habitats.

The proposed recreational improvements, including the boat ramp, picnic area, observation deck, trail system, and increased parking, could result in an increase in visitors. Increased visitors could negatively impact wildlife due to increased noise and human activity. Although recreational fishing activity may increase due to the improvements, monofilament recycling bins would be placed at the project site to reduce adverse impacts of fishing gear on protected species. This project would have minor, long-term adverse impacts on wildlife and marine and estuarine fauna (including protected species).

The FL TIG would coordinate and complete consultation with relevant regulatory agencies, if necessary, on this project regarding potential adverse impacts to protected species and habitats prior to project implementation. Surveys would be completed to determine if protected species are present at the site. If protected species were present, conservation measures recommended during consultation would be incorporated into final project design and implementation to avoid or minimize adverse impacts to protected species and critical habitats. Specific conservation measures would also be implemented during construction to avoid or minimize disruption and overall adverse impacts to protected species.

Sea turtles: Loggerhead, green, leatherback, hawksbill, and Kemp's ridley sea turtles could be present in the area. Turtle nesting typically occurs on sandy beaches along Indian Peninsula during the months of May through August, with hatching occurring from late July through October. Minimal suitable nesting beaches exist at the project site, although the Indian Peninsula is designated terrestrial critical habitat for loggerhead sea turtles. Nearshore waters around Indian Peninsula are also designated critical habitat for loggerhead sea turtles. There is potential for sea turtle encounters with private motorized vessels using the boat launches as turtles forage in the vicinity. However, the increase in boating activity and watercraft collisions with sea turtles should be negligible. If recommended during environmental compliance review, BMPs such as those identified within the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) and Measures for Reducing the Entrapment Risk to Protected Species (NMFS 2012) would be implemented and adhered to during periods of in-water work. Additionally, BMPs within the Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS 2008) would be implemented if recommended. This project may have moderate short-term and minor long-term adverse impacts on sea turtles.

West Indian manatee and marine mammals. The project location does not intersect with any identified critical habitat for the West Indian manatee, but manatees could potentially be present in the waters surrounding Indian Peninsula. Additionally, the St. Vincent Sound/Apalachicola Bay/St. George Sound Stocks and Gulf of Mexico Northern Coastal Stock of bottlenose dolphins could be present in the project area. Marine mammals are affected by vibrations and noise resulting from construction activities (e.g., generators, pile drivers). This project includes in-water work for the demolition of the existing boat launch and construction of a new launch. If recommended during environmental compliance review, the BMPs identified within the Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS 2008) and the Standard Manatee Conditions for In-water Work (USFWS 2011) would be implemented and adhered to during periods of in-water work. As a result of construction related activities from these improvements, this project may have short-term moderate adverse effects on the West Indian manatee and other marine mammals.

Giant manta ray. Giant manta rays inhabit a wide variety of nearshore and offshore productive marine habitats. Since the waters surrounding Indian Peninsula are open to the Gulf where giant manta rays are known to occur, the species could be present in the action area. Boat strikes and fishing gear entanglement are known causes of injury and mortality to giant manta rays. Since giant manta rays are highly mobile, they would likely avoid the area during construction. If recommended during environmental compliance review, BMPs would be implemented and adhered to during periods of in-water work. As a result of construction-related activities from these improvements, this project may have direct and/or indirect short-term minor adverse effects on the giant manta ray.

Gulf sturgeon, Gulf sturgeon critical habitat, and smalltooth sawfish: There is critical habitat for Gulf sturgeon (Unit 13) in Apalachicola Bay, and sturgeon are known to be in the bay and along the Gulf shoreline. Smalltooth sawfish inhabit nearshore sandy substrate habitats and may be located in the action area. Potential adverse impacts to sturgeon and sawfish include elevated noise levels and the presence of suspended sediments in the water column due to construction related activities. However, sturgeon and sawfish are highly mobile and can avoid any disturbances in that area by swimming away. If recommended during environmental compliance review, standard BMPs such as those identified in the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006) would be followed. As a result of proposed construction activities, this project may have short-term moderate adverse effects on Gulf sturgeon, Gulf sturgeon critical habitat, and smalltooth sawfish.

Piping plover, red knot, and wood stork: While piping plover, red knot, and wood stork are all known to inhabit St. Vincent Island, there is no known suitable habitat for these species on Indian Peninsula. To avoid and minimize adverse impacts if these species are present, the BMPs identified within the Habitat Management Guidelines for the Wood Stork in the Southeast Region (USFWS 1990) could be implemented. As such, this project would have no effect on piping plover, red knot, or wood stork.

Eastern indigo snake and gopher tortoise. The gopher tortoise is a terrestrial tortoise that occurs in well-drained sandy soils in sandhill, scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, and mixed hardwood pine habitats. The Eastern indigo snake is often found in gopher tortoise burrows. While the action area is highly developed, these two species may be found at the site.

If gopher tortoise burrows or individuals are encountered in construction and staging areas, they may be relocated (after consulting with USFWS). As such, this project may have minor short-term adverse effects to Eastern indigo snakes and gopher tortoises.

In summary, the project would have short- and long-term, minor adverse impacts to biological resources.

Socioeconomic Resources

The project would enhance public recreation in an area of the Panhandle that is currently being developed rapidly. The parcel proposed for recreational improvements has some existing campground infrastructure, roads, and parking. During construction, as noted above, equipment and operations would be located in previously disturbed areas as much as feasible. The use of construction equipment and barriers enacted to protect public safety during construction, and possible short-term closures of the area, would result in minor to moderate, short-term adverse impacts on recreational uses of the site as well as aesthetics and visual quality. These impacts would result from the presence of equipment, barriers and construction-related dust and emissions. During the construction period, visible impediments would detract from the natural landscape and create visual contrast for observers. This project would also be expected to result in a short-term increase in construction jobs.

There would be enhanced fishing opportunities in the long-term from the proposed project based on increased parking and the addition of the double-lane boat ramp. There is also the potential for highly desirable fishing experiences due to the unique location of the site at the pass to the Gulf, and increased access for anglers to offshore fishing opportunities for popular Gulf reef fish such as red snapper and grouper. Increased parking and water access for non-motorized boating would create new opportunities for recreation.

In summary, this project is anticipated to result in minor to moderate, short-term adverse impacts, as well as short- and long-term benefits to socioeconomic resources.

4.9.4 REC8, Florida Artificial Reef Creation and Restoration – Phase 2 (Preferred)

This project would implement the second phase of artificial reef development across Northwest Florida, creating new marine recreational fishing and diving opportunities for residents and visitors. Compared to Phase 1, this project provides a greater diversity of materials and locations to maximize recreational benefits across a broader geographic range and accommodate a greater variety of marine fish species to satisfy a wider spectrum of user groups. The placement of artificial reefs would provide new recreational fishing opportunities and enhance fishing experiences for saltwater anglers and reduce fishing pressure at existing natural and artificial reef fishing destinations. Activities most relevant to assessment of the environmental consequences of this project include:

- Constructing artificial reefs with one or more of the following materials: 1) rock boulders, 2) prefabricated concrete, or 3) designed modules.

4.9.4.1 Resources Analyzed in Detail for this Alternative

Table 4-20 identifies how potentially affected resources are analyzed for this alternative.

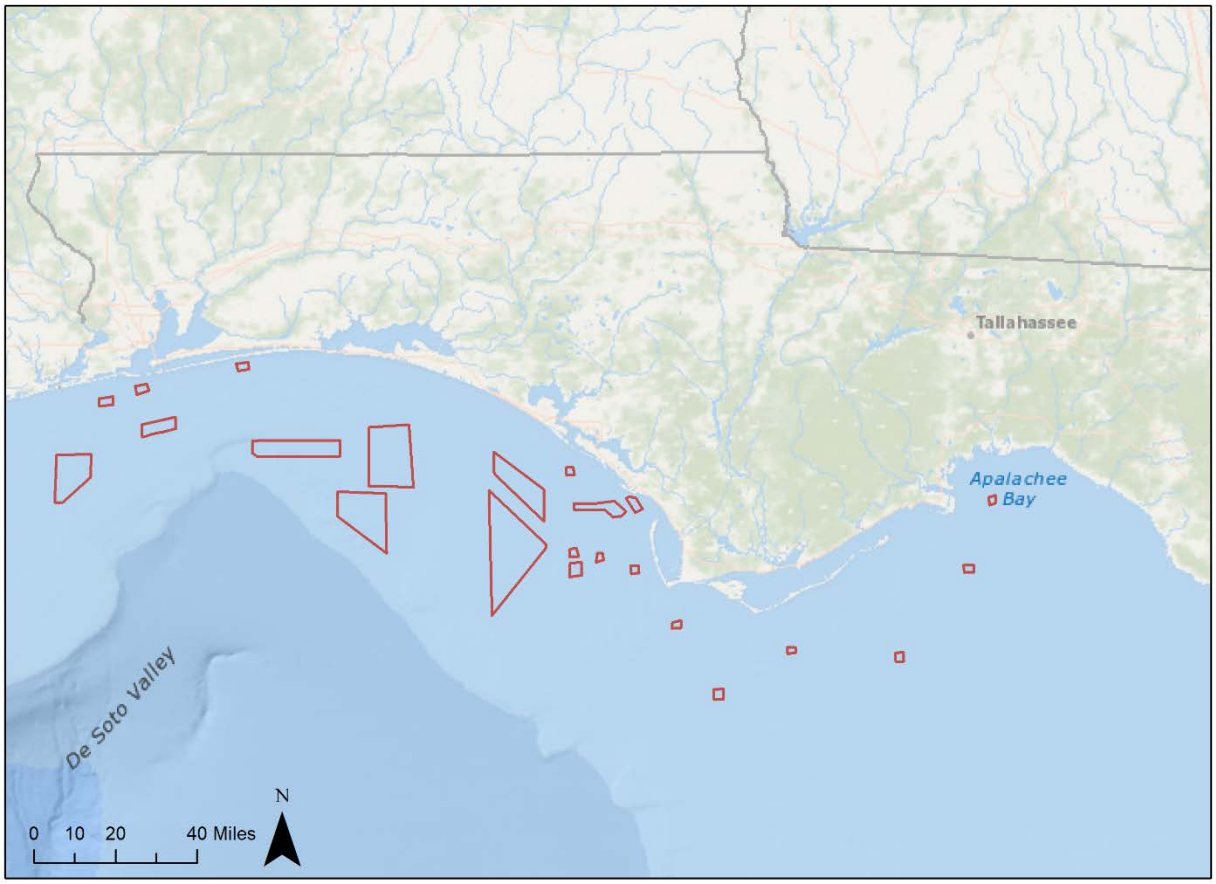
Table 4-20 NEPA Assessment of Resources for REC8

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.9.4.1
Hydrology and Water Quality	Analyzed in Section 4.9.4.1
Biological Resources	
Habitats	Analyzed in Section 4.9.4.1
Wildlife Species (including birds)	Analyzed in Section 4.9.4.1
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)	Analyzed in Section 4.9.4.1
Protected Species	Analyzed in Section 4.9.4.1
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.9.4.1
Aesthetics and Visual Resources	Analyzed in Section 4.9.4.1
Public Health and Safety	Analyzed in Section 4.9.4.1
Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.9.4.2 Affected Environment

Artificial reef sites proposed for construction are located in the northern Gulf, in coastal waters along the Florida Panhandle, adjacent to the following Florida counties: Escambia, Santa Rosa, Okaloosa, Walton, Bay, Gulf, Franklin, and Wakulla. Several areas are currently considered for construction, and specific sites would be identified in coordination with the counties (Figure 4-10 illustrates approximate locations for reef sites). Project areas are proposed in water depths ranging from 4-300 feet. No project work would be conducted on land.

Figure 4-10 Approximate Locations of Reef Sites for REC8, Florida Artificial Reef Creation and Restoration – Phase 2



Physical Resources

This alternative would occur across a large area of the Florida Panhandle (Figure 4-10). A description of physical resources in this location is provided in Section 4.6.2.2. Proposed project areas are located only in areas with unconsolidated, soft sand. When possible, sandy areas are further prioritized to select areas with a shallow hardbottom layer underneath the sand to minimize subsidence of artificial reef materials into unconsolidated sediments over time.

Biological Resources

This alternative would occur across a large area of the Florida Panhandle (Figure 4-10). A description of biological resources in this location is provided in Section 4.6.2.2. Project areas are located in areas of unconsolidated sediments, which are primarily inhabited by benthic infauna and epifauna. Seagrass, coral, and oyster reefs are not known to occur in any of the project areas. The project areas include EFH for coastal migratory pelagics, reef fish, shrimp, and habitat areas of concern for bluefin tuna (NOAA 2018).

Marine mammals known to occur in the proposed project areas include the Gulf subspecies of Bryde's whale (*Balaenoptera edeni*), Atlantic spotted dolphin, bottlenose dolphin, and the West Indian manatee. Project footprints also overlap biologically important areas for bottlenose dolphin (Van Parijs, Curtice,

and Ferguson 2020). Federally listed species, as identified by IPaC, potentially occurring in the project area are listed in Appendix E (USFWS 2018).

Socioeconomic Resources

This alternative would occur across a large area of the Florida Panhandle. A description of socioeconomic resources in this location is provided in Section 4.6.2.2. No known historic or cultural resources are present within any of the permitted areas. Side-scan and magnetometer surveys are completed as required during permitting, and all permitted areas have been reviewed and approved by the Florida Department of State. Some of the permitted areas contain existing permitted artificial reef structures, which currently provide recreational opportunities to Florida residents and visitors for fishing, diving, and snorkeling.

4.9.4.3 Environmental Consequences

The environmental consequences of projects intended to create artificial reef structures to enhance recreational experiences were evaluated in Section 6.4.13.2 of the PDARP/PEIS, which is incorporated here by reference.

Physical Resources

Implementation of this project would include in-water construction and the use of vessels to transport materials for the placement of artificial reef structures. This would include minor disturbances to marine substrates in the area during construction. Sediment disturbance could also result in short-term, minor adverse impacts to water quality.

Reef material would be clean and free of loose material or contaminants (i.e., free of pollutants, toxins, debris, trash, or other material that could negatively impact physical resources) in accordance with permit conditions. Reef material would be deployed using heavy equipment (backhoe, front-end loader, or crane) mounted on barges. All artificial reef materials would be slowly lowered to the seafloor. Any boulders and secondary-use concrete materials deployed off the contracted barge are not expected to generate turbidity during construction. The reefs would be designed and constructed with the primary objective to minimize in-water disturbance.

In summary, this project is anticipated to result in short-term, minor adverse impacts to physical resources.

Biological Resources

Moderate, short-term adverse impacts to benthic fauna and habitats may occur during construction, and minor, long-term adverse impacts may result from permanent displacement of soft-bottom benthic fauna and habitats; however, large areas of unconsolidated sediment are available in the area and fauna may occupy suitable habitat nearby. Seagrass, coral, and oyster reefs are not known to occur in any of the project areas; however, pre-construction surveys would be conducted to confirm seagrasses are not present within any of the artificial reef sites. If sensitive habitats are identified in or near any of the reef sites, a 200-foot buffer would be maintained between identified areas and any new artificial reef material placement locations to protect the sensitive biological resources from potential adverse impacts.

The FL TIG has completed technical assistance with relevant regulatory agencies regarding adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance

status. Protected species could be negatively impacted by short-term noise and vessel disturbance related to reef deployment, minor, long-term noise and vessel disturbance related to fishing vessel presence, habitat alteration, and entanglement from derelict fishing gear accumulation on reef material. Deployment-related adverse impacts on protected species are anticipated to be short-term and minor. During deployment, vessels carrying reef material would travel slowly (less than 10 knots), would use marine mammal or other endangered species observers, and would slowly lower reef modules to the seafloor. As recommended during environmental compliance review, BMPs would be implemented to reduce adverse impacts to protected species during construction, such as those described in the USFWS Standard Manatee Conditions for In-water Work (USFWS 2011), the NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006), the NMFS Measures for Reducing the Entrapment Risk to Protected Species (NMFS 2012), and the NMFS Vessel Strike Avoidance Measures and Reporting for Mariners (NMFS 2008). Additionally, artificial reef guidelines and specifications described in the NMFS National Artificial Reef Plan (NMFS 2007), the Florida Artificial Reef Strategic Plan (FWC 2003), and the Southeast Florida Coral Reef Initiative's Guidelines and Management Practices for Artificial Reef Siting, Use, Construction, and Anchoring in Southeast Florida (Southeast Florida Coral Reef Initiative 2011) would be consulted, where applicable.

Long-term adverse impacts to marine and estuarine fauna, including protected species, related to fishing vessel interactions, habitat alteration, and entanglement in accumulated derelict fishing gear on reef sites may be minor to moderate depending on the location of deployed reefs and type of reef material used. Since this project would not increase water access sites along the Panhandle, it should not result in a measurable increase in recreational fishing vessels in nearshore waters. Rather, vessel pressure may be more dispersed depending on where reefs are deployed. However, marine mammals (including the critically endangered Bryde's whale) and sea turtles are at risk of being struck by recreational vessels traveling to and from artificial reef sites. Protected species (especially sea turtles) may experience a higher risk of entanglement leading to injury or mortality from derelict fishing gear accumulating on artificial reefs. To reduce entrapment risk, BMPs and guidelines described in NMFS National Artificial Reef Plan (NMFS 2007), the Florida Artificial Reef Strategic Plan (FWD 2003), and the Southeast Florida Coral Reef Initiative's Guidelines and Management Practices for Artificial Reef Siting, Use, Construction, and Anchoring in Southeast Florida (Southeast Florida Coral Reef Initiative 2011) would be consulted, where applicable. Finally, all artificial reef placements would avoid Gulf sturgeon critical habitat and Bryde's whale core distribution area.

Long-term benefits are expected for fish and other marine fauna through the creation of new habitat.

In summary, this project is anticipated to result in minor to moderate, short- and long-term adverse impacts and long-term benefits to biological resources.

Socioeconomic Resources

Short-term, minor adverse impacts could occur in the immediate project areas during artificial reef construction, specifically by limiting recreational activities near the construction area in order to protect public safety, temporarily increasing vessel traffic due to movement of construction vehicles, and adversely affecting aesthetics due to the presence of construction equipment.

The project goal is to enhance recreational opportunities through construction of artificial reefs in suitable habitats across the coastal shelf of Florida's Panhandle. Florida residents and visitors are expected to benefit from enhanced recreational opportunities for fishing, diving, and wildlife viewing.

The construction of new artificial reef sites in the region would reduce pressure on existing sites, thus, improving individual experiences. The local economy is expected to benefit from tourism and employment opportunities directly associated with recreational fishing and diving. In the short-term, artificial reef design and construction, and in the long-term, fishing and diving operations are expected to provide employment opportunities in the regional community.

In summary, this project is anticipated to result in minor, short-term adverse impacts to socioeconomic resources and short- and long-term benefits.

4.9.5 REC9, Apollo Beach Recreational Sportfish Hatchery Facility (Preferred)

This project would be implemented as Phase 2 of the construction of FWC's marine fish stock enhancement facility in Apollo Beach, Florida. The goal of the project is to provide the brood stock capacity needed for a marine stock enhancement program in Florida and enhance recreational fishing opportunities, specifically for red drum and spotted seatrout. Release of hatchery-raised fish is not specifically included as a component of this project; however, juvenile fish, once produced, would be released into species-specific suitable habitats such as those found in parts of Tampa Bay, Sarasota Bay, and Charlotte Harbor and their tributaries, enhancing angling opportunities directly when they are caught and indirectly when survivors enter the adult spawning population. Phase 1 included design and construction of a 10,000-square foot marine fish hatchery, design and partial construction of an office, and all necessary aquaculture equipment. Phase 2 would expand on the construction begun in Phase 1, providing the necessary infrastructure to fully develop and improve techniques for fish production and stock enhancement for juvenile sportfish. Activities most relevant to assessment of the environmental consequences of this project include:

- Design and construct a 6,500-square foot fish production facility to support production and release of up to one million juvenile red drum and spotted seatrout annually; and,
- Complete construction of an office building (currently at 65 percent) to be used as an operations center for hatchery staff.

4.9.5.1 Resources Analyzed in Detail for this Alternative

Table 4-21 identifies how potentially affected resources are analyzed for this alternative.

Table 4-21 NEPA Assessment of Resources for REC9

Resource	Location of Analysis in Chapter 4
Physical Resources	
Geology and Substrates	Analyzed in Section 4.9.5.1
Hydrology and Water Quality[a]	Does not require additional analysis. Project activities would not impact hydrology and water quality.
Biological Resources	
Habitats	Analyzed in Section 4.9.5.1
Wildlife Species (including birds)	Analyzed in Section 4.9.5.1
Marine and Estuarine Fauna (fish, shellfish, benthic organisms)[a]	Does not require additional analysis. Project activities would not include any in-water work or disturbance to marine or estuarine fauna.
Protected Species	Analyzed in Section 4.9.5.1
Socioeconomic Resources	
Tourism and Recreational Use	Analyzed in Section 4.9.5.1
Aesthetics and Visual Resources	Analyzed in Section 4.9.5.1
Public Health and Safety	Analyzed in Section 4.9.5.1
[a] Resource does not require additional analysis for this alternative because it is unaffected by the alternative, or the impacts would be so minor that a more detailed NEPA analysis is not needed. Remaining resources are addressed in Section 4.3 (Resources with Similar Impacts Common to All Alternatives): Floodplains and Wetlands, Air Quality and GHG Emissions, Noise, Socioeconomics and Environmental Justice, Cultural Resources, Infrastructure, Land and Marine Management, Fisheries and Aquaculture, and Marine Transportation.	

4.9.5.2 Affected Environment

This alternative would implement a second phase of construction to further develop FWC's marine fish stock enhancement facility in Apollo Beach, Florida. The existing facility is located on an upland property in an area that is developed and surrounded by existing commercial sites and residential neighborhoods. The stock enhancement facility property is adjacent to Newman Branch, an estuarine canal that is a tributary to Tampa Bay; however, the property does not contain any water frontage. The property boundary is at least 30 feet from Newman Branch and approximately 2 miles from Tampa Bay.

Physical Resources

The site is located in an upland area that is highly developed for commercial and residential uses. Phase 1 of this project included constructing a 10,000-square foot marine fish hatchery, design and partial construction of an office, and installation of aquaculture equipment. Other site structures, such as parking lots and access roads, were constructed during Phase 1. Project area soils are predominantly fine sands (USDA-NRCS 2020). The site is entirely upland with no waterfront, intertidal, subtidal, or in-water project area. No naturally occurring surface water exists on site; however, a manmade effluent pond and saltwater marsh were previously permitted and constructed for aquaculture effluent to support the entire site plan (including the proposed second phase of facility construction in this alternative). The source for seawater for the hatchery is an existing saltwater well permitted for use by the SWFWMD.

Biological Resources

The project area is currently developed, providing only limited areas of habitat for terrestrial plants and animals. Small areas are sparsely vegetated by grass. Mangroves are present in the vicinity, but not in the project area. The project area does include freshwater forested/shrub wetland.

The greater Tampa Bay region does host some of the most diverse colonial waterbird nesting populations in North America. Even marginal habitat in the area may be used by resident and migratory birds. No federally listed species are known to occur in the project area (USFWS 2018).

Socioeconomic Resources

Florida has the nation's largest recreational fishing industry, with more world record fish catches than any other state. The fishing industry contributes in excess of $10 billion annually to the state's economy and supports one of the largest saltwater fishing-related tourism industries in the world (FWC 2020). Residents of and visitors to Tampa Bay, Sarasota Bay, Charlotte Harbor, and their tributaries value the region's recreational fishing opportunities, which provide economic benefits through tourism and employment opportunities in the local community.

FWC's existing stock enhancement facility in Apollo Beach is located in a mixed commercial/residential area. The regional economy is supported by a mix of tourism and local business. In general, the Tampa Bay area is less dependent on tourism compared to other regions of Florida. There are large residential and retirement communities, and the area provides a range of local recreational opportunities. The existing stock enhancement facility's effluent pond serves as a fishing pond for thousands of Florida youth anglers each year who typically do not have angling experiences otherwise.

4.9.5.3 Environmental Consequences

The environmental consequences of projects intended to enhance recreational fishing through aquaculture were evaluated in Section 6.4.13.2 of the PDARP/PEIS (DWH Trustees 2016a), which is incorporated here by reference.

Physical Resources

The site is currently developed in preparation for Phase 2 implementation that would build on the existing hatchery facility; thus, construction of the new production facility, continued office space development, and continued operation of the facility are not anticipated to result in significant additional adverse impacts on geology or substrates.

Furthermore, the existing stock enhancement facility was previously permitted for and is currently equipped with a functioning manmade effluent pond and saltwater marsh for aquaculture effluent, which follow all applicable BMPs from Florida's Division of Aquaculture. These systems were constructed during Phase 1 of facility construction and were designed to support the entire site plan, including Phase 2 (this alternative). The source for seawater for the hatchery is an existing saltwater well permitted for use by the SWFWMD. Any hazardous waste chemicals used in the stock enhancement facility are collected and disposed of following FDEP protocols.

In summary, this project is anticipated to result in minor, short-term adverse impacts to geology and substrates.

Biological Resources

As noted above, the site is currently developed in preparation for Phase 2 implementation; thus, construction of the new production facility, build-out of office space, and continued operation of the facility are not expected to result in significant additional adverse impacts on habitats or terrestrial wildlife. The project area is entirely upland. Facility construction and operations are not anticipated to negatively impact any nearby intertidal or estuarine resources. The FL TIG has completed technical assistance with relevant regulatory agencies regarding potential adverse impacts to protected species and habitats. See Table 4-24 for this project's environmental compliance status.

Although project activities only include construction of the stock enhancement facility, as discussed in the PDARP/PEIS, stock enhancement could produce long-term, minor to moderate adverse impacts if hatchery-reared fish negatively affect the genetic diversity of wild stocks. Further, increases in visitation to recreational fishing sites could lead to long-term adverse impacts on biological resources. However, if the survival of finfish or shellfish leads to an increase in fish or bivalve densities without displacing wild organisms, the increase in production of recreationally important fish would result in long-term benefits.

In summary, this project is anticipated to result in minor, short-term adverse impacts to biological resources.

Socioeconomic Resources

Construction of the stock enhancement facility may result in temporary increases in road traffic associated with movement of construction vehicles as well as changes in aesthetics due to the presence of construction equipment. In general, these adverse impacts are expected to be localized to the immediate project area and short-term.

In the short-term, facility construction, and in the long-term, facility operations and maintenance are expected to provide employment opportunities in the regional community. The project goal is to enhance recreational fishing opportunities through aquaculture and release of marine sportfish, specifically red drum (*Scieanops ocellatus*) and spotted seatrout (*Cynoscion nebulosus*), into species-specific suitable regional habitats. Residents of Tampa Bay, Sarasota Bay, Charlotte Harbor, and their tributaries are expected to benefit from enhanced recreational use. The local economy is expected to continue to benefit from tourism and associated employment opportunities associated with recreational fishing. Finally, the facility's effluent pond would continue to serve as a fishing pond for thousands of Florida youth anglers each year who typically do not otherwise have access to angling experiences.

In summary, this project is anticipated to result in minor, short-term adverse impacts and short- and long-term benefits to socioeconomic resources.

4.9.6 No Action

Under the No Action alternative, the RP/EA alternatives would not occur, and new or enhanced recreational access or recreational opportunities would not be provided. Water quality and hydrology would remain as they are in the project area. Ecological communities would not be disturbed or eliminated by construction of new or enhanced sites or facilities (e.g., artificial reef sites, parks, stock enhancement facility), amenities (e.g., parking areas, piers, boat ramps, kayak/boat launches, park facilities), or use of these areas. Properties being considered for acquisition (e.g., FM5/REC6) could become developed which would lead to minor to major, adverse impacts to physical and biological resources and possible adverse impacts to socioeconomic resources. Benefits to other resources (e.g.,

habitat restoration, stock enhancement of recreational fish) that would result from the Provide and Enhance Recreational Opportunities alternatives would not be realized.

4.10 NEPA Cumulative Impacts Analysis

The CEQ regulations for implementing NEPA require the assessment of cumulative impacts in the decision-making process. The CEQ defines cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR §1508.7). As stated in the CEQ handbook, Considering Cumulative Effects (CEQ 1997), cumulative impacts need to be analyzed in terms of the specific resource, ecosystem, and human community being affected and should focus on impacts that are truly meaningful. Cumulative impacts should be considered for all alternatives, including the no-action alternative.

The PDARP/PEIS (Section 6.17.2) states that consideration of cumulative impacts of proposed alternatives in RP/EAs should build on the programmatic analyses and focus on site-specific issues (DWH Trustees 2016a). This is consistent with the CEQ guidance regarding effective use of programmatic NEPA analysis. Section 6.6 and Appendix 6.B of the PDARP/PEIS are incorporated by reference into the cumulative impacts analysis, including the methodologies for assessing cumulative impacts, identification of affected resources, and the cumulative impacts scenario. The PDARP/PEIS found that implementation of restoration projects under the Habitat Projects on Federally Managed Lands, Sea Turtles, Marine Mammals, Birds, and Provide and Enhance Recreational Opportunities Restoration Types would be consistent with its Restoration Goals and would not be expected to contribute substantially to short- or long-term, adverse cumulative impacts on physical, biological, or socioeconomic resources when analyzed in combination with other past, present, and reasonably foreseeable future actions.

Section 6.6.2 of the PDARP/PEIS outlines the following steps involved in a cumulative impact analysis: (1) identify the resources affected, (2) establish the boundaries of analysis, (3) identify the cumulative impacts scenario, and (4) conduct a cumulative impacts analysis.

Regarding identification of the resources affected, the CEQ handbook states that the analyst must first determine the realistic potential for the resource to sustain itself in the future and whether the proposed action would affect this potential; therefore, the baseline condition of the resource should include a description of how conditions have changed over time and how they are likely to change in the future if the proposed action is not implemented. The baseline condition should also include other ongoing actions, as discussed in Section 6.6.4 of the PDARP/PEIS (DWH Trustees 2016a).

In order to properly bound the cumulative impacts analysis, the CEQ handbook recommends determining appropriate spatial and temporal impact boundaries. The alternatives analyzed in this RP/EA would have local and minor adverse impacts, most of which would be short term in duration (i.e., during implementation). Therefore, the FL TIG considered these short-term adverse impacts in concert with other present actions (i.e., restoration actions with impacts that would overlap with the implementation stage of the alternatives), thus limiting the temporal boundary of the analysis to the construction/implementation phases. In determining the spatial boundary, the FL TIG considered the programmatic analysis of cumulative impacts in the PDARP/PEIS, which analyzed impacts on a regional, ecosystem scale (DWH Trustees 2016a). The spatial boundary of the cumulative impacts analysis in this

RP/EA is a local scale. In summary, the analysis boundaries for this RP/EA include the Gulf and Northeast Coasts of Florida, including coastal uplands and nearshore waters over a 1-10 years implementation of the alternatives.

To identify the cumulative impacts scenario, the PDARP/PEIS describes the affected environment and evaluates the impacts of restoration as well as programmatic development activities by considering cumulative impacts from implementation of DWH Early Restoration (DWH Trustees 2012). The PDARP/PEIS analysis is incorporated by reference, where applicable (DWH Trustees 2016a). No significant cumulative impacts were concluded in this analysis. Where applicable, each RP/EA's cumulative impacts analysis should build on previous plans, incorporating only impacts not considered in previous analyses.

For past, present, and reasonably foreseeable future actions, past activities that have contributed to the current condition of resources are described and analyzed in Chapter 6 of the PDARP/PEIS and are not repeated in this analysis. The FL TIG identified relevant present and reasonably foreseeable future actions not analyzed in the previous documents and considered their potential impacts in the analysis (Table 4-22). Applicable to the Habitat Projects on Federally Managed Lands, Sea Turtles, Marine Mammals, Birds, and Provide and Enhance Recreational Opportunities Restoration Types, these include restoration related to the DWH oil spill such as barrier island/headland restoration, freshwater diversions, hydrologic restoration, marsh creation, oyster restoration, recreational use, and sediment diversions and other ongoing activities such as military operations, marine transportation, energy activities, dredged material disposal, marine mineral mining, fisheries and aquaculture, tourism and recreation, and coastal development and land use. Where these actions are planned and/or ongoing, they may apply as present and reasonably foreseeable future actions.

Sections 4.4-4.9 of this chapter analyze the environmental consequences analysis for each of the alternatives evaluated in this RP/EA. The alternatives evaluated in this RP/EA are designed to improve environmental quality or to increase access and enjoyment of natural resources. Adverse effects would not be anticipated to extend beyond the implementation period for a number of projects. Some resource areas would be affected over the long-term, some beneficially and some adversely. However, none of the projects included in this RP/EA would result in any long-term adverse effects that rise above a moderate-adverse effect. For example, most of the projects would result in only minor, short-term adverse impacts to geology and substrates, air quality, and hydrology and water quality during construction activities, and possibly short-term moderate and long-term minor adverse impacts on habitat and wildlife. Biological resources would primarily experience short-term, minor adverse impacts from human disturbance associated with project implementation. Socioeconomic resources would also experience only none to minor, short-term adverse impacts. Very few moderate adverse impacts would result to tourism and recreation use, aesthetics and visual resources, and public health and safety. Additionally, for many of the resources, projects are anticipated to result in no long-term adverse effects and long-term benefits. As such, the FL TIG concluded that although some of the projects may have an incremental contribution to adverse cumulative impacts, the contribution would not be substantial over the long-term. Many of the alternatives have the potential to provide long-term beneficial cumulative impacts to physical, biological, and socioeconomic resources. Thus, the FL TIG concludes that the Habitat Projects on Federally Managed Lands, Sea Turtles, Marine Mammals, Birds, and Provide and Enhance Recreational Opportunities alternatives in this RP/EA would not contribute substantially to adverse cumulative impacts when added to past, present, or reasonably foreseeable future actions.

Table 4-22 Summary of the Past, Present, and Reasonably Foreseeable Future Action Considered in the Cumulative Impact Analysis

Action Description	Key Resource Areas and Potential for Adverse Cumulative Impacts
Restoration Related to the DWH Oil Spill (funded by NRDA, RESTORE, and NFWF-GEBF)	
Project types funded by DWH would improve living coastal and marine resources (habitat, birds, fish, sea turtles, and marine mammals), water quality, and coastal resilience through shoreline protection, habitat protection, and acquisition. Other projects restore and enhance public access, recreational use opportunities, and infrastructure. Projects that are recently completed, planned, or are in process are listed below. Note that some many projects benefit multiple resources. **Wetlands Coastal Nearshore Habitat:** **Beach:** Gulf Islands National Seashore (Florida) Invasive Plant Removal; Florida (Pensacola Beach) Dune Restoration; Beach Enhancement Project at Gulf Island National Seashore; Perdido Key Dune Restoration; Comprehensive Panhandle Coastal Bird Conservation; St. Joseph Peninsula Beach Re-nourishment and Environmental Enhancement project; Gulf Islands National Seashore (Florida) Beach and Dune Habitat Protection; St. Vincent National Wildlife Refuge Predator Control; Restoration and Management of Escribano Point Coastal Habitat – Phase II. **Marsh:** Management and Restoration of Escribano Point Coastal Habitat – Phase I; Bayou Drive Repair and Restoration; Coastal Habitat Enhancement Program; Cockroach Bay Aquatic Preserve Land Acquisition and Ecosystem Restoration; Robinson Preserve Expansion Phase III/Wetlands Restoration; Yellow River Marsh Preserve State Park Restoration. **Oyster Restoration:** Apalachicola Bay Oyster Restoration; Oyster Reef Habitat Restoration in the Saint Andrew Bay; Horseshoe Cove Oyster Restoration; Florida Oyster Cultch Placement Project; Apalachicola Bay Oyster Restoration; Recovery and Resilience of Oyster Reefs in the Big Bend of Florida; Suwannee Sound/Cedar Key Oyster Recreation; Applied Research for Shellfish Aquaculture; Manatee River Oyster Restoration; Eastern Pensacola Bay Oyster Habitat Restoration- Phase I-II; Santa Rosa County Oyster Habitat Restoration Project. **SAV:** Florida Bay Seagrass Recovery Project; Seagrass Recovery Project at Gulf Islands National Seashore, Florida District. **Multiple/Other:** Pensacola Bay Living Shoreline; Florida Cat Point Living Shoreline Project; Portosueno Park Living Shoreline; Coral Reef Restoration for Florida Keys; Student-Led Habitat Restoration in Okaloosa County; Inshore Artificial Reef- Pithlachascotee River; Artificial Reef Program; Artificial Reef and Oyster Habitat Enhancement; Restoration of Florida's Coastal Dune Lakes – Phase I-II; Plant Removal and Habitat Improvement in Walton County's Rare Coastal Dune Lakes; Student-Led Habitat Restoration in Walton County; Walton County Artificial Reef Construction - Miramar/Frangista; Artificial Reef Deployment and Monitoring. **Living Coastal Marine Resources**:	Geology and substrates; Hydrology and water quality; Habitats; Marine and estuarine fauna; Terrestrial wildlife; Protected species; EFH; Land and marine management; Fisheries and aquaculture.

Action Description	Key Resource Areas and Potential for Adverse Cumulative Impacts
Birds: Florida Shorebird Conservation Initiative; Restoring Florida's Shorebird & Seabird Populations – Phase I; Southwest Florida Wading Bird Nesting Island Enhancement. **Fish:** Enhanced Assessment of Gulf of Mexico Fisheries – Phase I-IV; Offshore Fish Aggregating Devices (FADs); Benthic Habitat Mapping, Characterization, and Assessment. **Sea Turtles:** Enhancement of Sea Turtle Stranding Response Capacity in Florida; Improving Sea Turtle Hatchling Survivorship through Long-Term Predation Management; Eliminating Light Pollution on Sea Turtle Nesting Beaches – Phase I-III; Gulf Islands National Seashore (Florida) Night Sky Restoration (P&D); Gulfarium C.A.R.E. Center. **Marine Mammals:** Increased Capacity for Marine Mammal Response.	

Water Quality (including Hydrologic Restoration, Sediment Diversion): St. Andrew Bay Stormwater Improvement Program; Lower Charlotte Harbor Flatwoods Hydrologic Restoration Initiative, Yucca Pens Unit (P&D); North Bay Wastewater Collection System Improvements; North Bay Water Quality Improvement Program; Restoring the Impaired Waters of Charlotte Harbor; Charlotte Harbor Septic to Sewer Conversion Program; Water Quality Improvements to Enhance Fisheries Habitat in the Lower Choctawhatchee River Basin – Phase I; Springshed Stormwater Improvement Program; NW Quadrant Force Main Project; Comprehensive Watershed Improvement Program; Coastal Septic to Sewer Conversion Program; Carpenter Creek Headwaters Water Quality Improvements; Pensacola Beach Reclaimed Water System Expansion; City of Panama City Beach and Bay County Continuous Outfall Sediment Reduction Projects; Bayou Chico Restoration; Carpenter Creek and Bayou Texar Revitalization Plan; Eleven Mile Creek Basin; Eleven Mile Creek Stream Restoration; Hollice T. Williams Stormwater Park; OLF8 Commerce Park Improvements; South Dogtrack Drainage Project; Beach Haven - Joint Stormwater and Wastewater Improvement Project Phase II; Bayou Chico Contaminated Sediment Remediation Project; City of Carrabelle's Lighthouse Estates: Septic Tank Abatement - Phase II; City of Port St. Joe Stormwater Improvements; St. Joseph Bay/Chipola River Sewer Improvement Program, Coastal Stormwater Improvement- Calienta Street; Weeki Watchee Springshed Septic to Sewer Conversion Program; Delaney Creek/Palm River Septic to Sewer Conversion Program; Wacissa Springshed Water Quality Protection Program; North East Caloosahatchee Tributaries Restoration Project; Lower Suwannee River Watershed - Nutrient Reduction; Cedar Key Wastewater Improvements; Coastal Septic to Sewer Conversion Program; Lower Suwannee National Wildlife Refuge Hydrologic Restoration (P&D); Urban Park Stormwater Improvements- GT Bray Park; Canal Water Quality Improvements in Monroe County; Apalachicola Watershed Agriculture Water Quality Improvement; Boggy Bayou Watershed Water Quality Improvement; Destin Harbor, Joe's Bayou, and Indian Bayou Water Quality Improvement; Laffitte Crescent Stormwater Infrastructure Retrofit; Okaloosa Stormwater Retrofit Program; Shoal River Headwaters Protection Program; Orange Lake Restoration Project; Crews Lake Hydrologic Restoration; Hammock Creek/Sea Pines Watershed Stormwater Management Project; Madison Street and Gulf Drive Stormwater Retrofit Project; Lake Seminole Sediment Removal; Land Acquisition for Floodplain Restoration and Resiliency; Wastewater Collection System Improvements; Pensacola Bay and Perdido River Watersheds - Nutrient Reduction; Pensacola Bay Unpaved Roads Initiative (P&D); Rattlesnake Bluff Road and Riverbank Restoration; Dirt Road Paving Districts 1, 4, 5; Driftwood, Navy Cove, Berry Stormwater Improvements; Eufaula Outfall Treatment; Floridatown Water Quality Enhancement Project; Navarre Park Water Quality Enhancement Program; Rattlesnake Bluff Road Sedimentation Reduction Project; Santa Rosa Sound Water Quality Improvement Program; Dona Bay Hydrologic Restoration Program; Wakulla Springshed Water Quality Protection Program; Alligator Lake Coastal Dune Lake Hydrologic Restoration; City of Freeport Stormwater Master Plan and Capital Improvement Strategic Plan Update; Coastal Dune Lakes Hydrologic Restoration Project; Identifying Water Quality Impairments for Lagrange Bayou Black Creek; and Choctawatchee Bay; Old Town Santa Rosa TMDL Water Quality Restoration - Phase I; Walton County Stormwater Projects - Palmetto Road and Bay Grove Road Drainage Improvements; Choctawhatchee Bay Septic to Sewer Conversion. **Recreational Use:** Camp Helen State Park Improvements; St. Andrews State Park Improvements; City of Parker–Oak Shore Drive Pier; Panama City Marina Fishing Pier; Boat Ramp and Staging Docks; Strategically Provided Boat Access Along Florida's Gulf Coast; Restoring Bay County's Recreational Fishing Industry through Artificial Reef Construction and Promotion; Porter Park Improvements 2014; Carl Gray Park Boat Ramp; Harbor Walk Phase IB; Artificial Reef	

Action Description	Key Resource Areas and Potential for Adverse Cumulative Impacts
Program; Cross Florida Barge Canal Boat Ramp; Shired Island Park Beach Nourishment and Living Shoreline; Carpenter Creek Headwaters Park Amenities; Florida Boat Ramp Enhancement and Construction Project; Big Lagoon State Park Boat Ramp Improvements; Bob Sikes Pier; Parking and Trail Restoration; Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center; Gulf Islands National Seashore Ferry Project; Perdido Key State Park Beach Boardwalk Improvements; Perdido Key Gulf of Mexico Public Access; Perdido Key Multi-Use Path; Project Universal Access; Florida Artificial Reef Creation and Restoration; Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle; Bald Point State Park Recreation Areas; Apalachicola River Wildlife and Environmental Area Fishing and Wildlife Viewing Access Improvements; Enhancements of Franklin County Parks and Boat Ramps; Gulf County Recreation Projects; Hernando Beach Shallow Water Reef Project; Linda Pedersen Park Improvements; Artificial Reef Program; Coastal Public Access Program; Wacissa River Park Improvement Program; Cedar Key Aquarium at Nature Coast Biological Station; Clam Trail in Cedar Key and Surrounding Areas; Project ACE (Ambassadors for Conservation Education); Withlacoochee Gulf Preserve Equipment and Materials; Waccasassa River Conservation Land Acquisition; Florida Maritime Museum Facility Enhancement; Artificial Reef Program- Borden Reef; Coastal Preserve Trail and Boardwalk Enhancements; Palmetto Greene Bridge Fishing Pier Replacement; Florida Coastal Access Project; Suwannee River Partnership Irrigation Water Enhancement Program; Gulf Islands National Seashore (Florida) Rehabilitation of Okaloosa Unit Recreational Facilities; Joe's Bayou Recreation Area Improvements; Norriego Point Restoration and Recreation Project; Northwest Florida Estuarine Habitat Restoration; Protection and Education – Fort Walton Beach, Capt. Royal Melvin Heritage Park and Plaza; Clement Taylor Park Restoration and Pathway; Economic Revitalization of Niceville's Historic "Old Downtown"; Fort Walton Beach Landing Waterfront Improvements Phase, Multi-use Outdoor Community Facility; Okaloosa County Snorkel/Dive Reef Construction; The NeighborWood at Emerald Coast Science Center; Port Richey Waterfront Revitalization Project; Artificial Reef Program - Hudson Reef; Sunwest Park Restoration Project; Poor Richey Watershed Stormwater Management Project; Ranch Road Infrastructure Improvements; Government Street Regional Stormwater Pond at Corrine Jones Park; Fort De Soto Park Dune Walkovers; Developing Enhanced Recreational Opportunities at the Escribano Point Portion of the Yellow River Wildlife Management Area; Navarre Beach Park Coastal Access; Navarre Beach Park Gulfside Walkover Complex; Blackwater Heritage State Trail Infrastructure Improvements; Gulf Coast Kiln Walk Society Historical Working Center; Quinn Street Marina: Phase I; The Gulf Coast Discovery Center Phase I (Design & Permitting); St. Marks National Wildlife Refuge Coastal Trail Connection, Spring Creek to Port Leon; Shell Point Beach Nourishment; Topsail Hill Preserve State Park Improvements; Deer Lake State Park Development; Walton County Boardwalks and Dune Crossovers; Muscogee Nation of Florida Micro Farm Agritourism Project.	

Action Description	Key Resource Areas and Potential for Adverse Cumulative Impacts
Planning, Design, Infrastructure, and Other: Bay County Master Plan and Capital Improvement Strategic Plan Update (Stormwater); Panama City Marine Institute Dock Repair; Bay County East Pass Environmental Impact Statement (EIS) and Inlet and Beach Management Plan; Fisheries Monitoring; Collier County/Rookery Bay National Estuarine Research Comprehensive Watershed Improvement Plan Project Development and Permitting - Phase 1; Lower Suwannee and Gulf Watershed Conservation Easement; Horseshoe Beach Working Waterfront Project; Planning Assistance to Develop a Multiyear Implementation Plan; SOAR with RESTORE; Bayou Chico Contaminated Sediment Removal Planning, Design, and Permitting; Pensacola Bay Living Shoreline Phase I; Florida Gulf Environmental Benefit Fund Restoration Strategy; Comprehensive Plan Commitment and Planning Support Award; Florida Gulf Consortium's Planning State Expenditure Plan; Planning Assistance to Develop a Multiyear Implementation Plan; Tate's Hell Strategy 1 (Planning & Implementation); Apalachicola Bay Cooperative Dredging Program; Emergency Operations Center; Planning Assistance to Develop a Multiyear Implementation Plan; Money Bayou Wetlands Restoration; St. Joseph Peninsula Coastal Erosion Control Project; Palm River Restoration Project Phase II; East McKay Bay; Tampa Bay Estuary Program; Inner Marina Maintenance Dredging; Lower Withlacoochee Environmental Study; Outdoor Electronic Touchsreen 24/7 KIOSK; Planning Assistance to Develop a Multiyear Implementation Plan; Coastal Watershed Program; Gulf Shellfish Institute Sea Farm to Table; Coastal Watershed Management Plans; Preserve Management Plans; Canal Management Master Plan Implementation; Gulf of Mexico Estuary Program; Gulf Consortium (FL) Planning Grant for State Expenditure Plan; A Web-Based Interactive Decision-Support Tool for Adaption of Coastal Urban and Natural Ecosystems (ACUNE) in Southwest Florida; Centers of Excellence Research Grants; Choctawhatchee Bay Estuary Program; Coastal Environmental Research Network (CERN); Coastal Ocean Monitoring and Prediction System (COMPS); Pinellas County Assessment of Vulnerability to the Impacts of Sea Level Rise and Infrastructure Resiliency Plan; Very High Resolution Estuary Circulation Nowcast and Forecast Model for Tampa Bay and Vicinity; Planning Assistance to Develop a Multiyear Implementation Plan; Post-Secondary Career and Technical Education Program; Manufacturing Career Cluster; Second Chance Outreach Re-Entry and Education Development and Job Skills Training Program, Cedar Island Canal Dredging, Project 4; Dark Island Canal Dredging, Project 3; Dekle Beach Canal Dredging, Project 5; Keaton Beach Canal Dredging, Project 1; Steinhatchee Boat Ramp Basin Canal Dredging, Project 2; Wakulla Marshes Sands Park Improvements; County Road 30A Intermodal Transportation Innovation Program (ITIP); Planning Assistance for Future MYIP Revisions.	
Military Operations	

Action Description	Key Resource Areas and Potential for Adverse Cumulative Impacts
The US Air Force and US Navy conduct military operations within federally designated areas of Florida for the purposes of personnel training, research, design, testing, and evaluation. The US Navy facilities are located in Pensacola, Panama City, Key West, Homestead, Mayport, Jacksonville, and some other smaller stations, which conduct training and operations in Florida coastal waters.	Geology and substrates; Hydrology and water quality; Habitats; Marine and estuarine fauna; EFH; Land and marine management; Fisheries and aquaculture.
Marine Transportation	
Marine Highway Corridors are used for port development; shipping and maritime services; and associated navigation, channel construction, and maintenance. Future actions are likely to occur along corridors (M10) or at ports in Florida as maritime traffic is expected to increase.	Hydrology and water quality; Habitats; Marine and estuarine fauna; EFH; Land and marine management; Fisheries and aquaculture.
Dredged Material Disposal	
Navigational channels, marinas, and other publicly used water bottoms are dredged as needed to maintain navigability. Dredged materials are either beneficially used as part of another project or deposited in a designated disposal location.	Geology and substrates; Hydrology and water quality; Habitats; Marine and estuarine fauna; Protected species; EFH; Land and marine management; Fisheries and aquaculture.
Marine Mineral Mining, Including Sand and Gravel Mining	
According to USGS, in 2014[65], the value of Florida's nonfuel mineral production was $2.89 billion. Florida is the only state producing staurolite; leads in the production of attapulgite, peat, and phosphate rock; and is a major producer of masonry and portland cements, titanium concentrates (ilmenite), and zirconium concentrates (USGS 2014).	Geology and substrates; Hydrology and water quality; Habitats; Marine and estuarine fauna; Protected species; EFH; Land and marine management; Fisheries and aquaculture.
Fisheries and Aquaculture	

[65] The most recent annual report; source: USGS. 2014. 2014 Minerals Yearbook: Florida. Available at www.usgs.gov/centers/nmic/mineral-industry-florida.

Action Description	Key Resource Areas and Potential for Adverse Cumulative Impacts
FWC is responsible for regulating recreational and commercial fishing as well as aquaculture activities within Florida state waters. The agency provides licenses and permits; leases coastal submerged land for aquaculture; sets catch limits, quotas, and seasons; regulates harvest and processing; and provides technical assistance.	Geology and substrates; Hydrology and water quality; Habitats; Marine and estuarine fauna; Protected species; EFH; Land and marine management; Fisheries and aquaculture.
Tourism and Recreation	
Examples include park upgrades to walking and biking paths.	Geology and substrates; Habitats; Terrestrial wildlife; Protected species; EFH; Land and marine management.
Coastal Development and Land Use	
Examples of coastal development activities include commercial, residential, and other development; roadway maintenance and improvement; structural and nonstructural risk reduction projects; marsh creation; sediment diversions; and hydrologic and ridge restoration.	Geology and substrates; Hydrology and water quality; Habitats; Marine and estuarine fauna; Terrestrial wildlife; Protected species; EFH; Land and marine management; Fisheries and aquaculture.

4.11 Comparison of Alternatives

The environmental analysis demonstrated that there would be primarily minor, but also some moderate short- and long-term adverse impacts as well as environmental benefits from implementation of the RP/EA alternatives. In general, implementation of the RP/EA alternatives would result in minor, short-term adverse impacts to physical resources including geology and substrates, air quality, and hydrology and water quality. There would be only some minor, long-term adverse effects to air quality and noise associated with some Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities projects where impacts are from increased visitation and vehicular traffic. A few of the RP/EA alternatives would also result in benefits to geology and substrates and hydrology and water quality. Biological resources would primarily experience short-term, minor adverse impacts from human disturbance (e.g., foot traffic, human presence) associated with project implementation. Alternatives that include construction activities, such as projects proposed under the Habitat Projects on Federally Managed Lands and Provide and Enhance Recreational Opportunities Restoration Types, may have short-term moderate and long-term minor adverse impacts on habitat and wildlife (including marine and/or protected species). However, biological resources would experience long-term benefits from habitat improvement projects. Lastly, for socioeconomic resources, the RP/EA alternatives would result in none to minor, short-term adverse impacts. Very few moderate adverse impacts would result to tourism and recreation use, aesthetics and visual resources, and public health and safety. No long-term adverse impacts are anticipated. Further, most projects in the RP/EA would result in long-term benefits to socioeconomic resources. The No Action alternative is anticipated to result in short- and long-term minor to moderate adverse impacts. A summary of impacts for each restoration alternative and the No Action alternative is provided in Table 4-23.

As addressed in the PDARP/PEIS, alternatives that include E&D activities could cause short-term, minor adverse impacts through associated fieldwork. Adverse impacts from REC3, the one E&D project in this RP/EA, could result from site visits or surveys required for design and permitting but would be very minor and localized to the project site. Alternatives that include data-gathering and educational activities would also have limited adverse impacts, and at most, would cause short-term, minor, localized impacts. Adverse impacts to the biological and physical environment could include short-term disturbance of habitats and species, minor emissions from vehicles, and minor disturbance to terrestrial, estuarine, and marine environments. Implementing Trustees would conduct due diligence to ensure that no unanticipated effects to listed species and habitats would occur. Adverse impacts would be minimized by following mitigation measures, BMPs, and other guidance developed during the permitting process, environmental reviews, consultation process, and other relevant regulatory requirements. The FL TIG would also consider best practices referenced in Section 6.15 and Appendix 6.A of the PDARP/PEIS (DWH Trustees 2016a).

Table 4-23 Summary of the Direct and Indirect Impacts of the Reasonable Range Restoration Alternatives

Restoration Alternative	Geology and Substrates	Hydrology and Water Quality	Air Quality	Noise	Habitats	Wildlife Species	Marine and Estuarine Fauna	Protected Species	Socioeconomics Environmental Justice	Cultural Resources	Infrastructure	Land and Marine Management	Tourism and Recreational Use	Fisheries and Aquaculture	Marine Transportation	Aesthetics and Visual Resources	Public Health and Safety
No Action	NE	NE	NE	NE	I	I	I	I	NE	NE	I	I	I	I	NE	I	I
FM1	s,+	NE	s,I	s,I	S,+	S,+	NE	S,+	s,+	NE	NE	NE	s,+	NE	NE	s,+	s,+
FM2	s,+	s	s	s	S,+	S,+	S,+	S,+	s,+	NE	NE	NE	s,+	NE	s	s,+	s,+
FM3	s,+	NE	s	s	S,+	S,+	NE	S,+	s,+	NE	+	NE	s,+	NE	NE	s,+	s,+
FM4	NE	NE	NE	NE	+	+	+	+	+	NE	+	NE	+	NE	NE	+	NE
FM5/REC6	s,I	s,I	s,I	s,I	s,I,+	s,I,+	NE	s+	s+	NE	+	NE	s,+	NE	NE	s	s
ST1	I	NE	NE	NE	I	I	I	S+	NE	NE	NE	NE	+	NE	+	+	NE
ST2	s,+	s,+	s	s	s,+	s,+	s,+	s,+	NE	NE	NE	NE	+	+	+	+	+
ST3	NE	NE	s	s	s	s	s	s,+	NE	NE	NE	NE	s	NE	NE	NE	NE
ST4	s,+	s,+	s	s	s+	S,L,+	NE	S,L,+	NE	NE	NE	NE	S,L,+	NE	NE	S,L,+	S,L,+
MM1	s	s	s	s	s	S	S	S,L,+	NE	NE	NE	NE	s,+	NE	NE	s,+	s,+
MM2	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
B1	s,+	s,+	s	s	s,+	s,+	s,+	s,+	NE	NE	NE	NE	s,+	s+	NE	s,+	s,+
B2	s,+	s,+	s	s	s,+	s,+	NE	s,+	NE	NE	NE	NE	s,+	NE	NE	s,+	s,+
B3	s	NE	s	s	s,+	S,L,+	NE	s,+	NE	NE	NE	NE	s,+	NE	NE	s,+	s,+
B4	s,+	NE	s	s	s,+	S,L,+	NE	s,+	NE	NE	NE	s,I,+	s,I,+	NE	NE	s,+	s,+
B5	s,+	NE	s	s	s,+	S,L,+	NE	s,+	NE	NE	NE	s,I,+	s,I,+	NE	NE	s,+	s,+
REC1	s,I	s,I	s,I	s,I	S,L	S,I	S,I	S,I	s,+	NE	s,+	+	s,+	NE	+	s,+	s,+
REC2	s,I	s,I	s,I	s,I	S,L	S,I	S,I	S,I	s,+	NE	s,+	NE	s,+	NE	s,+	s,+	s,+
REC3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Restoration Alternative	Geology and Substrates	Hydrology and Water Quality	Air Quality	Noise	Habitats	Wildlife Species	Marine and Estuarine Fauna	Protected Species	Socioeconomics Environmental Justice	Cultural Resources	Infrastructure	Land and Marine Management	Tourism and Recreational Use	Fisheries and Aquaculture	Marine Transportation	Aesthetics and Visual Resources	Public Health and Safety
REC4	s,I	s,I	s,I	s,I	S,L	S,L	S,L	S,L	s,+	NE	s,+	NE	s,+	NE	+	s,+	s,+
REC5	S,L	S,L	s,I	s,I	S,I	S,L	S,L	S,L	s,+	NE	s,+	+	s,+	NE	+	s,+	s,+
REC7	S,L	S	s,I	s,I	S,L	S,I	S,I	S,I	s,+	NE	+	+	S,+	NE	s	S,+	S,+
REC8	s	s	s,I	s,I	S,I,+	s,L,+	s,L,+	s,L,+	s,+	NE	+	+	s,+	s,+	s	s	s
REC9	s	NE	s,I	s,I	s	s	NE	NE	s,+	NE	+	NE	+	+	NE	NE	s

Key:

+	Beneficial effect
NE	No effect
s	Short-term minor adverse effect
S	Short-term moderate adverse effect
S	**Short-term major adverse effect**
I	Long-term minor adverse effect
L	Long-term moderate adverse effect
L	**Long-term major adverse effect**

4.12 Compliance with Environmental Laws and Regulations

The FL TIG would ensure compliance with all applicable state and local laws and other applicable federal laws and regulations relevant to the proposed restoration alternatives. The FL TIG has completed technical assistance reviews with relevant agencies for protected species and their habitats under the ESA, Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act, permits under Section 404 of the CWA and Section 10 of the RHA, consistency with the Coastal Zone Management Act (CZMA) for the preferred alternatives, and other federal statutes, where appropriate. Additionally, the FL TIG will complete technical assistance reviews for cultural resources under the National Historic Preservation Act. The current compliance status by project at the time of this Draft RP2/EA is provided below in Table 4-24.

Projects involving in-water work would require a Section 404 permit, pursuant to the CWA. Any work in U.S. waters, including wetlands, associated with this alternative would be coordinated with the USACE pursuant to Section 404 of the CWA. Coordination with USACE and final authorization pursuant to CWA and RHA would be completed prior to final design and construction. USACE and NMFS construction guidelines would be followed, where possible, regarding pier construction (USACE/NMFS 2001).

Wherever existing consultations or permits are present, they will be reviewed to determine if the consultations/permits are still valid or if re-initiation of any consultations or permits are necessary. Implementing Trustees are required to implement alternative-specific mitigation measures (including BMPs) identified in the RP/EA, BE forms and completed consultations/permits. Oversight, provided by the Implementing Trustees, would conduct due diligence with regard to ensuring no unanticipated effects to listed species and habitats occur, including ensuring that BMPs are implemented and continue to function as intended. As noted above, pursuant to the CZMA, federal activities must be consistent to the maximum extent practicable with the federally approved coastal management programs for states where the activities would affect a coastal use or resource. Federal Trustees are submitting consistency determinations for state review coincident with public review of this document.

Federal environmental compliance responsibilities and procedures would follow the Trustee Council's SOPs, which are laid out in Section 9.4.6 of that document. Following these SOPs, the Implementing Trustees for each alternative would ensure that the status of environmental compliance (e.g., completed, in progress) is tracked through the Restoration Portal. The Implementing Trustees would keep a record of compliance documents (e.g., ESA letters, permits) and ensure that they are submitted for inclusion in the Administrative Record. Additional information specific to each preferred alternative regarding the environmental compliance requirements and their status are provided in the project-specific descriptions earlier in this chapter. Status of environmental compliance by statute and project is provided in Table 4-24 below.

Table 4-24 Current status of federal regulatory compliance reviews and approvals of preferred alternatives at release of Draft RP/EA

Preferred alternatives	Coastal Zone Management Act (CZMA)	Endangered Species Act - Section 7 (NMFS)	Endangered Species Act - Section 7 (USFWS)	Magnuson Stevens Act (EFH) (NMFS)	Marine Mammal Protection Act (MMPA) (NMFS)	Marine Mammal Protection Act (MMPA) (USFWS)	National Historic Preservation Act (NHPA)	Rivers and Harbors Act/Clean Water Act (USACE permit)	Bald and Golden Eagle Protection Act	Coastal Barrier Resources Act
Restoration Type: Habitat Projects on Federally Managed Lands										
FM1. Johnson Beach Access Management and Habitat Protection	IP	C-NE	C-EC	C	C	IP	IP	N/A	IP-NLAA	IP
FM2. Perdido Key Sediment Placement	IP	IP-NLAA	IP-NLAA	IP	IP	IP	IP	IP	IP-NLAA	IP
FM4. Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits	IP	C-NE	IP-NE	C	C	IP	IP	N/A	IP-NLAA	IP
FM5/REC6. St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass	IP	N/A	IP-NLAA	N/A	C	IP	IP	N/A	IP-NLAA	IP
Restoration Type: Sea Turtles										
ST1. Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast	IP	C-EC	C-EC	C	C	C-EC	IP	N/A	IP-NLAA	N/A
ST2. Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast	IP	IP-NLAA	IP-NLAA	C	C	IP	IP	IP	IP-NLAA	N/A
ST3. Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast	IP	C-EC	IP-NLAA	C	C	IP	IP	N/A	IP-NLAA	N/A
Restoration Type: Marine Mammals										
MM1. Florida Gulf Coast Marine Mammal Stranding Network	IP	C-EC	C-EC	C	C	IP	IP	N/A	IP-NLAA	N/A

Preferred alternatives	Coastal Zone Management Act (CZMA)	Endangered Species Act - Section 7 (NMFS)	Endangered Species Act - Section 7 (USFWS)	Magnuson Stevens Act (EFH) (NMFS)	Marine Mammal Protection Act (MMPA) (NMFS)	Marine Mammal Protection Act (MMPA) (USFWS)	National Historic Preservation Act (NHPA)	Rivers and Harbors Act/Clean Water Act (USACE permit)	Bald and Golden Eagle Protection Act	Coastal Barrier Resources Act
Restoration Type: Birds										
B1. Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers	IP	IP-NLAA	IP-NLAA	C	C	IP	IP	IP	IP-NLAA	IP
B2. Egmont Key Vegetation Management and Dune Retention	IP	N/A	IP-NLAA	N/A	C	IP	IP	N/A	IP-NLAA	IP
B3. Northeast Florida Coastal Predation Management	IP	N/A	IP-NLAA	N/A	C	IP	IP	N/A	IP-NLAA	N/A
B4. Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years	IP	N/A	IP-NLAA	N/A	C	IP	IP	N/A	IP-NLAA	N/A
Restoration Type: Provide and Enhance Recreational Opportunities										
REC1. Pensacola Community Maritime Park Public Fishing Marina	IP	C-EC	IP-NLAA	C	C	IP	IP	C-EC	IP-NLAA	IP
REC2. Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades	IP	IP-NLAA	IP-NLAA	C	C	IP	IP-NLAA	IP	IP-NLAA	IP
REC3. Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements	IP	C-NE	C-NE	C	C	C	C-NE	N/A	IP-NE	N/A
REC4. Gulf Breeze Parks Boating and Fishing Access Upgrades	IP	IP-LAA	IP-NLAA	C	C	IP	IP	IP	IP-NLAA	IP
REC5. Lincoln Park Boat Ramp and Dock Improvements	IP	C-EC	IP-NLAA	C	C	IP	IP	C-EC	IP-NLAA	N/A
REC8. Florida Artificial Reef Creation and Restoration – Phase 2	IP	IP-NLAA	IP-NLAA	C	C	IP	IP	IP	IP-NLAA	IP
REC9. Apollo Beach Recreational Sportfish Hatchery Facility	IP	C-NE	IP-NE	C	C	IP	IP	N/A	IP-NLAA	N/A

Preferred alternatives	Coastal Zone Management Act (CZMA)	Endangered Species Act - Section 7 (NMFS)	Endangered Species Act - Section 7 (USFWS)	Magnuson Stevens Act (EFH) (NMFS)	Marine Mammal Protection Act (MMPA) (NMFS)	Marine Mammal Protection Act (MMPA) (USFWS)	National Historic Preservation Act (NHPA)	Rivers and Harbors Act/Clean Water Act (USACE permit)	Bald and Golden Eagle Protection Act	Coastal Barrier Resources Act
C: Complete C-EC: Complete, covered by existing compliance C-NE: Complete, no effect C-NLAA: Complete, not likely to adversely affect IP: In progress IP-NLAA: In progress, not likely to adversely affect IP-LAA: In progress, likely to adversely affect N/A: Not applicable										

4.12.1 Additional Laws

Examples of applicable laws or executive orders include, but are not necessarily limited to, those listed below. Additional detail on each of these can be found in the PDARP/PEIS (Chapter 6; DWH Trustees 2016a). Additional federal laws may apply to the preferred alternatives considered in this RP/EA. Legal authorities applicable to restoration alternative development were fully described in the context of the DWH restoration planning in the 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.

- Endangered Species Act (16 U.S.C. §§1531 *et seq.*)
- Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§1801 *et seq.*)
- Marine Mammal Protection Act (16 U.S.C. §§1361 *et seq.*)
- 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.*)
- Migratory Bird Treaty Act (16 U.S.C. §§703 *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 (CWA, 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. §§ 1221-1226)
- 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 (augmented by EO 13690, January 30, 2015), as amended.
- Executive Order 11990: Protection of Wetlands, as amended.
- Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, as amended.
- Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks.
- Executive Order 12962: Recreational Fisheries, as amended by Executive Order 13474, September 26, 2008.
- Executive Order 13112: Safeguarding the Nation from the Impacts of Invasive Species, as amended by Executive Order 13751, Dec. 5, 2016.
- Executive Order 13175: Consultation and Coordination with Indian Tribal Governments, as amended.
- Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds, as amended.
- Executive Order 13693: Planning for Federal Sustainability in the Next Decade, as amended.

LITERATURE CITED

AAZV (American Association of Zoo Veterinarians). 2006. Guidelines for the Euthanasia of Nondomestic Animals.

AL TIG (Alabama Trustee Implementation Group). 2018. 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. September. www.gulfspillrestoration.noaa.gov/sites/default/files/2018-09%20AL%20RP%20II%20EA%20and%20Appendices_091318.pdf.

AVMA (American Veterinary Medical Association). 2020. AVMA Guidelines for the Euthanasia of Animals. www.avma.org/KB/Policies/Documents/euthanasia.pdf

Cacela, D. and Dixon, P.M. 2013. A statistical analysis of loggerhead turtle (*Caretta caretta*) nesting rates in western Florida, 1997–2012. (ST_TR.06). DWH Sea Turtles NRDA Technical Working Group Report. 15 pgs. www.fws.gov/doiddata/dwh-ar-documents/894/DWH-AR0096905.pdf.

CEQ (Council on Environmental Quality). 1997. Considering Cumulative Effects Under the National Environmental Policy Act. Executive Office of the President. January. www.ceq.doe.gov/docs/ceq-publications/ccenepa/toc.pdf.

Dodd, C.K. 1998. Biomass of an island population of Florida box turtles (*Terrapene Carolina bauri*). U.S. Geological Survey, Biological Resources Division. Journal of Herpetology: 32:1.

DWH Trustees *(Deepwater Horizon* Natural Resource Damage Assessment Trustees). 2012*. Deepwater Horizon* Oil Spill Phase I Early Restoration Plan and Environmental Review*.* December. www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Phase-II-ERP-ER-12-21-12.pdf.

_____. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement. February. www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

_____. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the Deepwater Horizon Oil Spill. Revised November 15, 2016. www.gulfspillrestoration.noaa.gov/sites/default/files/TC%20SOP%202.0%20with%20appendices.pdf.

_____. 2017a. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0, Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. Updated August 2019. www.gulfspillrestoration.noaa.gov/monitoring-and-adaptive-management.

_____. 2017b. Strategic Framework for Marine Mammal Restoration Activities. June. www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Marine_Mammal_Strategic_Framework_06.23.17.pdf.

_____. 2017c. Strategic Framework for Sea Turtle Restoration Activities. June. www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Sea_Turtle_Strategic_Framework_6.23.17.pdf.

Executive Order No. 12898, 59 F.R. 7629 (1994).

Executive Order No. 13045, 62 F.R. 19885 (1997).

FDEP (Florida Department of Environmental Protection). 2009. Guana Tolomato Matanzas National Estuarine Research Reserve Management Plan. 316 pgs. publicfiles.dep.state.fl.us/cama/plans/aquatic/GTM-NERR-Management-Plan-2009.pdf.

_____. 2017. Fort Clinch State Park Approved Unit Management Plan. 210 pgs. floridadep.gov/sites/default/files/FCSP_Approved_1.pdf.

_____. July 2020a. Critically Eroded Beaches in Florida. 88 pgs. floridadep.gov/sites/default/files/FDEP_Critically%20Eroded%20Beaches_2020_FINAL.pdf.

_____. 2020b. Environmental Resource Permit for Lincoln Park Boat Ramp Improvements. Issued August 7, 2020. Okaloosa County. Permit No. 0352931-004-EI/46.

_____. Updated June 10, 2020c. Geologic Maps and Borehole Data Maps. Accessed October 21, 2020. www.arcgis.com/home/item.html?id=7a85fea2918a4e1f8effdb5bc9fe87f9.

_____. 2020d. Statewide Comprehensive Verified List of Impaired Waters. Updated April 30, 2020. floridadep.gov/dear/watershed-assessment-section/documents/comprehensive-verified-list.

FEMA (Federal Emergency Management Agency). 2020. Flood Maps Service Center. Flood Insurance Rate Maps (FIRM). Accessed October 2020. www.msc.fema.gov/portal/home.

Fernandez, M. 1996. A Preliminary Contamination Assessment Near the Former Roundhouse, Fort Dade, Egmont Key National Wildlife Refuge, Florida. Tampa, FL: U.S. Geological Survey (prepared for the U.S. Fish and Wildlife Service). October.

FL TIG (Florida Trustee Implementation Group). 2019. *Deepwater Horizon* Oil Spill Final Restoration Plan 1 and Environmental Assessment: Habitat Projects on Federally Managed Lands; Nutrient Reduction; Water Quality; and Provide and Enhance Recreational Opportunities. www.gulfspillrestoration.noaa.gov/sites/default/files/2019-03%20FL%20final%20RP%201%20EA_Plan%20only.pdf.

FNAI (Florida Natural Areas Inventory). 2010. Guide to the Natural Communities of Florida: 2010 edition. Florida Natural Areas Inventory, Tallahassee, FL. www.fnai.org/PDF/FNAI-Natural-Community-Classification-Guide-2010_20150218.pdf

Frater, B. 2015. Assessing injury to loggerhead sea turtles in Alabama. (ST_TR.04). DWH Sea Turtles NRDA Technical Working Group Report. Prepared for U.S. Fish and Wildlife Service. www.fws.gov/doiddata/dwh-ar-documents/894/DWH-AR0063419.pdf.

FSD (Florida Shorebird Database). 2020. Web application. Version 2.20.0. Accessed August 1, 2020. www.public.myfwc.com/crossdoi/shorebirds/

FWC (Florida Fish and Wildlife Conservation Commission). 2003. State of Florida Artificial Reef Strategic Plan. November 21, 2003. https://www.mbara.org/pdf/Florida%20Artificial%20Reef%20Strategic%20Plan.pdf.

_____. 2018. Florida Seagrass. Accessed in Environmental Response Management Application (EMRA). Accessed September 20, 2020. www.erma.noaa.gov/gulfofmexico/erma.html#/layers=3+39436&x=-85.84357&y=30.28408&z=12.5&panel=layer.

_____. 2019a. Florida's Wildlife Legacy Initiative: Florida's State Wildlife Action Plan. Tallahassee, Florida. https://myfwc.com/media/22767/2019-action-plan.pdf.

_____. 2019b. Oyster Habitats in Florida. Accessed in Environmental Response Management Application (ERMA). Accessed November 23, 2020. www.erma.noaa.gov/gulfofmexico/erma.html#/layers=2+4400&x=-83.07501&y=29.13908&z=14.3&panel=layer

_____. 2019c. FWC Sea Turtle Nest Occurrence, 1979-2018. Updated November 8. Accessed October 20, 2020. https://myfwc.maps.arcgis.com/apps/webappviewer/index.html?id=8e6e45efc47a4c69941ddcb097cb195a.

_____. 2020. The Economic Impacts of Saltwater Fishing in Florida. Updated November 2020. Accessed January 1, 2021. www.myfwc.com/conservation/value/saltwater-fishing/

Hayes, S.A. et al. (eds.). 2020. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2019. NMFS-NE-264. https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region.

Herrington, S.J. et al. 2011. Inventory and Prioritization of Impaired Sites in the Yellow River Watershed in Alabama and Florida. DOD Legacy Resource Management Program. Report 09-432. www.denix.osd.mil/nr/vegetationandhabitat/freshwaterhabitat/reports/inventory-and-prioritization-of-impaired-sites-in-the-yellow-river-watershed-in-alabama-and-florida-final-report-november-2011-legacy-09-432/.

Kildow, Judith. 2008. “Phase II Facts and Figures Florida’s Ocean and Coastal Economies Report”. Prepared for the Florida Oceans and Coastal Council. https://cbe.miis.edu/cgi/viewcontent.cgi?article=1013&context=noep_publications

LA TIG (Louisiana Trustee Implementation Group). 2020. Final Restoration Plan/Environmental Assessment #5: Living Coastal and Marine Resources (LCMR) – Marine Mammals and Oysters. www.gulfspillrestoration.noaa.gov/sites/default/files/2020-08%20LA%20Louisiana%20Trustee%20Implementation%20Group%20Final%20RP.EA5_.pdf.

Lewis, T. 1986. The Pensacola Bay System, an Analysis of Estuarine Degradations and Their Relationships to Land Management Practices. Florida Department of Community Affairs. 132 p. Tallahassee, Florida.

Livingston, G. and Arthur, K. 2002. The economic impact of Pensacola Beach. Unpublished report, Haas Center for Business Research and Economic Development, University of West Florida, Pensacola, FL.

NMFS (National Marine Fisheries Service). 2003. Regional Biological Opinion on Hopper Dredging Navigational Channels and Borrow Areas in the Gulf of Mexico. Revised 2005 and 2007. National Oceanic and Atmospheric Administration NMFS Southeast Regional Office. November. www.fisheries.noaa.gov/content/endangered-species-act-section-7-biological-opinions-southeast

_____. 2006. Sea Turtle and Smalltooth Sawfish Construction Conditions. NOAA NMFS Southeast Regional Office. Available at: www.sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/documents/sea_turtle_and_smalltooth_sawfish_construction_conditions_3-23-06.pdf.

_____. 2007. National Artificial Reef Plan (as Amended): Guidelines for Siting, Construction, Development, and Assessment of Artificial Reefs. February 2007.

_____. 2008. Vessel Strike Avoidance Measures and Reporting for Mariners. February 2008. www.fisheries.noaa.gov/southeast/consultations/regulations-policies-and-guidance.

_____. 2009. Final Programmatic Environmental Impact Statement for the Marine Mammal Health and Stranding Response Program. Available at: www.repository.library.noaa.gov.

_____. 2012. Measures for Reducing Entrapment Risk to Protected Species. Revised May 22, 2012. www.sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/documents/entrapment_bmps_final.pdf.

_____. 2016a. Biological and Conference Opinion the Issuance of Permit No. 18786-01 to the Marine Mammal Health and Stranding Response Program Pursuant to Section 109(h), 112(c), 104(c) and Title IV: of the Marine Mammal Protection Act and Section 10(a)(1)(A) of the Endangered Species Act, and Implementation of the Marine Mammal Health and Stranding Response Program. FPR-2016-9166. Available at: www.repository.library.noaa.gov/view/noaa/14333

_____. 2016b. Biological Opinion on Reinitiation of ESA Section 10(a)(1)(A) Permit by Regulation to Authorize Response to Stranded Endangered Sea Turtles. FPR-2016-9168. Available at: www.repository.library.noaa.gov

_____. 2016c. Framework Biological Opinion on *Deepwater Horizon* Oil Spill Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement. SER-2015-17459. Available at: www.fisheries.noaa.gov/content/endangered-species-act-section-7-biological-opinions-southeast.

_____. 2017. Programmatic Biological Opinion on 10 Categories of Minor In-Water Activities Occurring in Florida and the U.S. Caribbean – JAXBO. SER-2015-17616. Available at: www.fisheries.noaa.gov/content/endangered-species-act-section-7-biological-opinions-southeast.

NMFS and USFWS (National Marine Fisheries Service and United States Fish and Wildlife Service). 1991. Recovery Plan for the U.S. Population of Atlantic Green Turtle (*Chelonia mydas*). National Marine Fisheries Service, Washington, D.C. Available at: www.repository.library.noaa.gov

_____. 2008. Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (*Caretta caretta*). Second revision. www.repository.library.noaa.gov

NOAA (National Oceanic and Atmospheric Administration). 2013. Programmatic Environmental Assessment for the NOAA Marine Debris Program. U.S. Department of Commerce www.marinedebris.noaa.gov/sites/default/files/mdp_pea.pdf

NOAA (National Oceanic and Atmospheric Administration). Updated 2018. Essential Fish Habitat – Gulf of Mexico. Silver Spring, MD: National Oceanic and Atmospheric Administration. www.habitat.noaa.gov/application/efhinventory/index.html.

NOAA OR&R (National Oceanic and Atmospheric Administration Office of Response and Restoration), UNH (University of New Hampshire), and USEPA (Environmental Protection Agency). 2018. Environmental Response Management Application (ERMA), Gulf of Mexico. Accessed September 20, 2020. www.erma.noaa.gov/gulfofmexico/erma.html.

NOEP (National Ocean Economics Program). 2016. "State of the U.S. Ocean and Coastal Economies Coastal States Summaries - 2016 Update."

NPS (National Park Service). 2014a. Environmental Assessment for the Fort Pickens Road Realignment. Gulf Islands National Seashore. October.

_____. 2014b. General Management Plan and Environmental Impact Statement Fort Matanzas National Monument. U.S. Department of the Interior. July. www.parkplanning.nps.gov/document.cfm?parkID=378&projectID=11093&documentID=59555.

_____. 2014c. Gulf Islands National Seashore Final General Management Plan/Environmental Impact Statement. U.S. Department of the Interior. July. www.nps.gov/guis/learn/management/upload/Gulf-Islands-GMP-EIS-JULY-2014.pdf.

_____. 2016a. Biological Assessment to Improve Barrier Island Habitat and Visitor Access at Perdido Key / Johnson Beach Area. Gulf Islands National Seashore. March.

_____. 2016b. Environmental Assessment to Improve Barrier Island Habitat and Visitor Access at Perdido Key / Johnson Beach Area. Gulf Islands National Seashore. June.

_____. 2018. Finding of No Significant Impact to Improve Barrier Island Habitat and Visitor Access at Johnson Beach/Perdido Key Area. Gulf Islands National Seashore. April

NWFWMD (Northwest Florida Water Management District). 2017b. Pensacola Bay SWIM Plan. Northwest Florida Water Management District Program Development Series 17-06. www.nwfwater.com/Water-Resources/Surface-Water-Improvement-and-Management/Pensacola-Bay-System.

Pruner, R. A, Friel, M. J., and Zimmerman, J. A. 2011. Interpreting the influence of habitat management actions on shorebird nesting activity at coastal state parks in the Florida panhandle. 2010-11

study final report. Florida Department of Environmental Protection, Florida Park Service, Panama City.

Riensche, D. 2007. California least tern habitat enhancement and nesting in the East Bay Regional Park District, California. Transactions of the Western Section of the Wildlife Society. 43:62-71.

Southeast Florida Coral Reef Initiative. 2011. Guidelines and Management Practices for Artificial Reef Siting, Use, Construction, and Anchoring in Southeast Florida. TP-176. www.eos.ucs.uri.edu/seagrant_Linked_Documents/flsgp/flsgph11003.pdf

St. Johns County. 2003. Habitat conservation plan: a plan for the protection of sea turtles and Anastasia Island beach mouse on the beaches of St. Johns County, Florida. August. www.sjcfl.us/hcp/HabitatConservation.aspx

USACE (U.S. Army Corps of Engineers). 2010. Environmental assessment and finding of no significant impact for the Lower Pensacola Harbor federal navigation channel. January.

USACE/NMFS (U.S. Army Corps of Engineers/National Marine Fisheries Service). 2001. Construction Guidelines in Florida for Minor Piling-Supported Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat. August.

U.S. Census Bureau. 2019. QuickFacts Beta. Accessed October 22, 2020. www.census.gov/quickfacts/fact/table/US/PST045217.

USDA-APHIS-WS (U.S. Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services). 2003. Management of Predation Losses to State and Federally Endangered, Threatened, and Species of Special Concern; and Feral Hog Management to Protect Other State and Federally Endangered, Threatened, Species of Special Concern, and Candidate species of Fauna and Flora in the State of Florida. Prepared in coordination with U.S. Department of the Interior (USFWS and NPS), U.S. Department of Defense (U.S. Air Force), FDEP, and FWC.

_____. 2013. Environmental assessment for mammal damage in Florida. January.

USDA-NRCS (U.S. Department of Agriculture Natural Resources Conversation Service). n.d. Cultural Resources. Accessed September 6, 2020. www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/cultural.

USDA-NRCS (U.S. Department of Agriculture Natural Resource Conservation Service). 2020. Web Soil Survey. Accessed October 4, 2020. www.websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

USEPA (U.S. Environmental Protection Agency). 2020. Current Nonattainment Counties for All Criteria Pollutants. Last updated October 31, 2020. Accessed October 1, 2020. www3.epa.gov/airquality/greenbook/ancl.html.

USFWS (U.S. Fish and Wildlife Service). 1990. Habitat management guidelines for the wood stork in the Southeast Region. www.fws.gov/northflorida/woodstorks/Documents/19900100_gd_Wood-stork-habitat-guidelines-1990.pdf.

_____. 2010a. Shore Protection Activities along the Coast of Florida, Statewide Programmatic Biological Opinion, Final Version for the Pensacola Navigation Channel Maintenance Project. U.S. Department of the Interior. 41410-2009-F-0205.

_____. 2010b. Tampa Bay Refuges – Egmont Key National Wildlife Refuge, Pinellas National Wildlife Refuge, Passage Key National Wildlife Refuge – Comprehensive Conservation Plan. U.S. Department of the Interior. www.fws.gov/southeast/planning/PDFdocuments/TampaBayFinal/TampaBayFinalCCPsection.pdf.

_____. 2011. Standard Manatee Conditions for In-water Work. www.myfwc.com/media/7246/manatee_stdcondin_waterwork.pdf.

_____. 2012. St. Vincent National Wildlife Refuge Comprehensive Conservation Plan. U.S. Department of the Interior. www.fws.gov/refuge/St_Vincent/what_we_do/planning.html.

_____. 2013. Standard Protection Measures for the Eastern Indigo Snake. www.fws.gov/northflorida/indigosnakes/20130812_EIS%20Standard%20Protection%20Measures_final.pdf.

_____. 2015. Programmatic BO for Section 10(a)(1)(A) Permit Application from the North Florida Field Office for Sea Turtle Recovery Activities. U.S. Department of the Interior.

_____. 2017. Gulf Islands National Seashore – Johnson Beach Area Parking Lot Expansion Project Biological Opinion, Gulf Islands National Seashore, Escambia County, Florida. U.S. Department of the Interior. www.fws.gov/panamacity/resources/20170329_BO_%20JohnsonBeachParkingBO.pdf.

_____. 2018. Information for Planning and Conservation (IPaC). Accessed April 17, 2018. www.ecos.fws.gov/ipac/ powered by the Environmental Conservation Online System.

_____.2019. Region 4 Intra-Service Section 7 Biological Evaluation Form. Originating Person: Joyce Kleen. Project Name: Exotic plant control on Egmont Key NWR and State Park and Pinellas NWR. November 15, 2019.

USGS (U.S. Geological Survey). 2016. National Land Cover Database. www.usgs.gov/centers/eros/science/national-land-cover-database?qt-science_center_objects=0#qt-science_center_objects.

Van Parijs, S. M., Curtice, C., & Ferguson, M. C. (Eds.). (2015). Biologically important areas for cetaceans within U.S. waters. Aquatic Mammals (Special Issue), 41(1), 1-128.

Whittam, R.M., & Leonard, M.L. 1999. Predation and breeding success in roseate terns (*Sterna dougallii*). Canadian Journal of Zoology. 77(6): 851-856.

Witherington, B.E. & Martin, R.K. 2003. Understanding, Assessing, and Resolving Light-Pollution Problems on Sea Turtle Nesting Beaches. Florida Marine Research Institute Technical Reports. Florida Fish and Wildlife Conservation Commission FMRI Technical Report TR-2.

APPENDIX A. LIST OF PREPARERS AND REVIEWERS

Agency/Firm	Name	Position
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U.S. Environmental Protection Agency	Tim Landers	Life Scientist
U.S. Environmental Protection Agency	Chris McArthur	Environmental Engineer
U.S. Environmental Protection Agency	James Bove	Attorney
U.S. Environmental Protection Agency	Dan Holliman	NEPA Coordinator

APPENDIX B MONITORING AND ADAPTIVE MANAGEMENT PLANS

MAM plans for each of the preferred alternatives are provided below.

FM1, Johnson Beach Access Management and Habitat Protection: Monitoring and Adaptive Management Plan

Prepared by: U.S. Department of the Interior (DOI)

Draft Version Date: 1/7/2021

1 Introduction

This project monitoring and adaptive management (MAM) plan identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the restoration project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degree of uncertainty, this project-specific MAM plan is scaled according to level of uncertainty, scope, scale, and Restoration Type associated with this project.

This MAM plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this document would be made publicly available through the Trustee Council Restoration Portal (www.diver.orr.noaa.gov/web/guest/home) and accessible through the *Deepwater Horizon* (DWH) Natural Resource Damage Assessment (NRDA) Trustees website (www.restoration.noaa.gov/dwh/storymap/).

Project Overview

This project is being implemented as restoration for the DWH NRDA, consistent with the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS).

- Programmatic Goal: Restore and Conserve Habitat
- Restoration Type: Habitat Projects on Federally Managed Lands
- Restoration Approach: Restore and enhance dunes and beaches
- Restoration Technique: Protect dune systems through the use of access control
- TIG: Florida Trustee Implementation Group (FL TIG)
- Restoration Plan: Restoration Plan #2

This restoration project is being implemented within the Gulf Islands National Seashore (GUIS), Florida district, Perdido Key area. This project includes restoration actions to protect dune habitat at GUIS by managing visitor access points through 1) replacing all road-side parking with three designated parking lots, 2) constructing new dune crossovers, and 3) converting the last 0.5 miles of road to a bicycle-pedestrian-only path. The project includes additional measures to protect sensitive areas with symbolic fencing, the removal of ineffective dune crossovers, and predator/human disturbance deterrents. This project would directly benefit federally managed beach and dune habitat.

The implementing agency is the DOI, in coordination with the National Park Service (NPS) and GUIS staff.

Restoration Type Goals and Project Restoration Objectives

The overall goals for this Restoration Type relevant to this project, as identified in the PDARP/PEIS, are:

- Restore federally managed habitats that were affected by the oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats.
- Restore for injuries to federally managed lands by targeting restoration on federal lands where the injuries occurred, while considering approaches that provide resiliency and sustainability.
- Ensure consistency with land management plans for each designated federal land and its purpose by identifying actions that account for the ecological needs of these habitats.

The project restoration objectives are:

- As designed and scoped, construct three parking lots on the north side of the road, eight new dune crossovers with handrails, and a speed hump near each lot; install post-and-rope fencing around lots and predator-proof trash receptacles; and remove existing dune crossovers and pavement from the easternmost 0.5 mile of the road to create a 12-foot wide bicycle-pedestrian-only path.
- Restore beach and dune habitat by reducing anthropogenic disturbances to habitat.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Records 990.55(b)(1)(vii)). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

Potential Sources of Uncertainty

Potential uncertainties that may affect the success of this project are described below.

Table 1-1 Potential Uncertainties

Uncertainty	Summary of Resolution Strategy
Contractor(s) doesn't build new facilities as designed/scoped.	Withhold payment until they do. Find new contractor if needed.
Elimination of roadside parking is not acceptable to the public or visitors do not comply as hoped. Social trails continue.	Increase enforcement patrols, signage, and outreach; possibly increase post-and-rope fencing.

Conceptual Model, Anticipated Outcomes and Future Activities

The conceptual model, described below, forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities and the desired project outcomes. The proposed restoration activities would provide benefits to habitats and natural resources at GUIS by addressing known causes of habitat degradation and mortality and/or protection of threatened and endangered species.

Table 1-2 Conceptual Model

Activity	Output	Short-term outcome	Long-term outcome
Construct three new parking lots and eliminate roadside parking.	Parking lots installed, no roadside parking.	Trampling of beach-dune habitat and disturbance of fauna is reduced.	Healthier beach-dune habitat connectivity; reduced wildlife disturbance. Change in visitor use patterns.
Remove/replace existing crossovers and install symbolic fence.	Crossovers are installed.	Trampling of beach-dune habitat and disturbance of fauna is reduced.	Healthier beach-dune habitat connectivity; reduced wildlife disturbance. Change in visitor use patterns.
Convert last 0.5 mile of road to a 12-foot-wide bicycle-pedestrian-only path.	Asphalt is removed and new path installed.	Less pavement and increased recreational opportunities.	Healthier beach-dune habitat connectivity; reduced wildlife disturbance. Public enjoyment of Perdido Key is increased.
Crosswalks (speed humps) installed at parking lots.	Visitors are guided to crossovers.	Visitors access the Gulf and the lagoon via crossovers.	Healthier beach-dune habitat connectivity; reduced wildlife disturbance.

2 Adaptive Management

As noted above, there is some uncertainty related to whether reductions in human impacts would occur after project implementation. To adaptively manage this project, and increase the likelihood of achieving the project objective, the DOI project personnel would conduct targeted monitoring and use the monitoring data to refine future management actions.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed.

Information on each monitoring parameter is provided below, organized by objective. The list of corrective actions provided below is not exhaustive; rather, it includes a list of potential actions to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: As designed and scoped, construct three parking lots on the north side of the road, eight new dune crossovers with handrails, and a speed hump near each lot; install post-and-rope fencing around lots and predator-proof dumpsters; and remove existing dune crossovers and pavement from the easternmost 0.5 mile of the road to create a 12-foot wide bicycle-pedestrian-only path.

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Features exist as designed/scoped	To confirm contract deliverables	Visual inspections and progress reports from contractor(s)	Upon completion of each feature and periodically during construction	At least twice at each feature	Design plans and specifications	Withhold payment until delivered as scoped; legal action if needed; hire new contractor(s)

Objective 2: Restore beach and dune habitat by reducing anthropogenic disturbances to habitat.

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Cars parked on roadside	To determine visitor compliance with parking and use of crossovers	Timed visual observation	2 times per week April through October	1.5-mile length of road	Cars on roadside and humans in habitat eliminated	Increase enforcement, signage, education
Shorebirds are undisturbed	Maintain/ restore habitat connectivity and use by fauna	Document shorebird nesting using data from the Florida Shorebird Database, a central repository for data collected on shorebirds and seabirds in Florida using The Breeding Bird Protocol for Florida's Shorebirds and Seabirds	One nesting season before project, three seasons after completion, per Florida Shorebird Alliance protocols	TBD, to include adjacent to in between each parking lot	Increase or maintain use of the sites by shorebirds	Increase enforcement, signage, education
Perdido Key beach mouse (PKBM; *Peromyscus polionotus trissyllepsis*) is undisturbed	Maintain/ restore habitat connectivity and use by fauna	Conduct PKBM surveys using tracking tubes/burrow counts	Once before projects, three times after completion (details TBD)	TBD, to include adjacent to in between each parking lot	Increase or maintain use of the sites by PKBM	Increase enforcement, signage, education

4 Monitoring Schedule

The schedule for project performance monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameters	Year 1	Year 2 (construction)	Year 3	Year 4	Year 5
Features exist as scoped		x			
Cars parked on roadside	x		x	x	x
Shorebird surveys	x		x	x	x
PKBM surveys	x		x	x	x

5 Evaluation

The FL TIG anticipates conducting an evaluation of the monitoring data collected (as described above) to help answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration 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?

6 Data Management

Data Description

Data collection would be compiled within 12 months after collection. To the extent practicable, all environmental and biological data generated during monitoring activities would be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then project-specific datasheets would be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs would be retained by DOI.

Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format as appropriate per protocols. All field datasheets and notebook entries would be scanned to PDF files. Electronic data files should be named with the date on which the file was created and should 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 should be made and the original preserved.

All data would have properly documented Federal Geographic Data Committee/International Organization for Standardization (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, Quality Assurance/Quality Control (QA/QC) procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents).

Data Review and Clearance

Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format. After transcription of the data, the electronic data sheets would be verified 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 would verify and validate MAM data and information and would ensure that all data are: i) entered or converted into agreed upon/commonly used digital format; ii) labeled with metadata following FGDC/ISO standards to the extent practicable and in accordance with Implementing Trustee agency requirements.

After all identified errors are addressed, data are considered to be QA/QC'ed. The Implementing Trustee would give the other FL TIG members time to review the data before making such information publicly available (as described below).

Data Storage and Accessibility

Once all data has been QA/QC'ed it would be submitted to the Restoration Portal. Trustees would provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than 1 year from when data are collected.

Data Sharing

Data would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Explorer Interface within 1 year of when the data collection occurred.

7 Reporting

All reporting would occur after field surveys are completed annually. This report would summarize the findings for the sampling period including all worksheets transferred into digital format and presented in tabular and graphical formats. The data should be summarized in such a way that it is meaningful to the reader. Additionally, an annual report would be completed that includes:

- Summary data –synthesized data for all efforts during the year.
- Graphics, if applicable, and associated interpretations of the data.
- Comparisons of pre- and post-project conditions, as applicable.
- Any uncertainties with management actions.
- Potential data collection issues.
- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Data would be reviewed and submitted to the Restoration Portal by DOI U.S. Fish and Wildlife Service project personnel.

FM2, Perdido Key Sediment Placement: Monitoring and Adaptive Management Plan

Prepared by: U.S. Department of the Interior (DOI)

Draft Version Date: 1/7/2021

1 Introduction

This project monitoring and adaptive management (MAM) plan identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the restoration project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degree of uncertainty, this project-specific MAM plan is scaled according to level of uncertainty, scope, scale, and Restoration Type associated with this project.

This MAM plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this document would be made publicly available through the Trustee Council Restoration Portal (www.diver.orr.noaa.gov/web/guest/home) and accessible through the *Deepwater Horizon* (DWH) Natural Resource Damage Assessment (NRDA) Trustees website (www.restoration.noaa.gov/dwh/storymap/).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS).

- Programmatic Goal: Restore and Conserve Habitat
- Restoration Type: Habitat Projects on Federally Managed Lands
- Restoration Approach: Restore and enhance dunes and beaches
- Restoration Technique: Renourish beaches through sediment addition, Restore or construct barrier and coastal islands and headlands via placement of dredged sediments
- TIG: Florida Trustee Implementation Group (FL TIG)
- Restoration Plan: Restoration Plan #2

This restoration project is being implemented within the Gulf Islands National Seashore (GUIS), Florida district, Perdido Key area. This project includes restoration actions to enhance beach dune habitat at GUIS by placing dredged material in the swash-zone or on the beach of the easternmost section of Perdido Key.

The implementing agency is the DOI, in coordination with the National Park Service (NPS) and GUIS staff.

Restoration Type Goals and Project Restoration Objectives

The overall goals for this Restoration Type relevant to this project, as identified in the PDARP/PEIS, are:

- Restore federally managed habitats that were affected by the oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats.

- Restore for injuries to federally managed lands by targeting restoration on federal lands where the injuries occurred, while considering approaches that provide resiliency and sustainability.
- Ensure consistency with land management plans for each designated federal land and its purpose by identifying actions that account for the ecological needs of these habitats.

The project restoration objectives are:

- Partially supplement the sand budget at Perdido Key by placing at least 400,000 cubic yards of sediment dredged from Pensacola Pass onto the Gulf-side beach or swash-zone within the easternmost 2 miles of Perdido Key by Spring of 2026.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 990.55(b)(1)(vii)). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

Potential Sources of Uncertainty

Potential uncertainties that may affect the success of this project are described below.

Table 1-1 Potential Uncertainties

Uncertainty	Summary of Resolution Strategy
Placement of sediment does not provide appropriate habitat to beach-dwelling fauna in this part of Perdido Key.	If relevant, remove escarpments or sand compaction that impede beach-dwelling fauna.

Conceptual Model, Anticipated Outcomes and Future Activities

The conceptual model, described below, forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities, and the desired project outcomes. The proposed restoration activities would provide benefits to habitats and natural resources at GUIS by placing sand on a section of Perdido Key that is unnaturally narrow from historical sediment deficits.

Table 1-2 Conceptual Model

Activity	Output	Short-term outcome	Long-term outcome
Place dredged sediment on Perdido Key.	Sand deficit on one part of Perdido Key is supplemented.	Increases the resilience of this part of Perdido Key to storms.	Incrementally increases resilience of all of Perdido Key to storms.
Ensure the conditions of newly placed sediment are amenable to natural use by sea turtles and other beach-dwelling fauna.	Provides appropriate habitat to beach-dwelling fauna in this part of Perdido Key.	Provides appropriate habitat to beach-dwelling fauna in this part of Perdido Key.	Incrementally increases habitat to beach-dwelling fauna in all of Perdido Key.

2 Adaptive Management

As noted above, there is some uncertainty related to whether sediment placement results in habitat for beach-dwelling fauna would occur after project implementation. To adaptively manage this project, and increase the likelihood of achieving the project objectives, the DOI project personnel would conduct targeted monitoring and use the monitoring data to refine future management actions.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed.

Information on each monitoring parameter is provided below, organized by objective or additional post-implementation monitoring. The list of corrective actions provided is not exhaustive; rather, it includes a list of potential actions to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective: Supplement the sand budget at Perdido Key by placing at least 400,000 cubic yards of sediment dredged from Pensacola Pass onto the Gulf-side beach or swash zone within the easternmost 2 miles of Perdido Key by Spring of 2026.

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Volume placed	To confirm contract deliverable and to increase understanding of relationship between volume dredged and dimensions created	Combination of gauges, GPS units, and surveys	During dredging operations and at end	Some regular interval (to be determined [TBD]) and at completion	Greater than or equal to 400,000 cubic yards	Pre-agreement with the U.S. Army Corps of Engineers (USACE) to keep dredging
Area	To know what was created and to increase understanding of how it evolves/ moves over time	"Before" and "after" topographic surveys by USACE	Less than or at 1 month before placement and at least quarterly for 12 months after	Number and location of survey transects is TBD	N/A	N/A
Shoreline position	To know what was created and to increase understanding of how it evolves/moves over time	"Before" and "after" topographic surveys by USACE	Less than or at 1 month before placement and at least quarterly for 12 months after	Number and location of survey transects is TBD	N/A	N/A
Elevation	To know what was created and to increase understanding of how it evolves/ moves over time	"Before" and "after" topographic surveys by USACE	Less than or at 1 month before placement and at least quarterly for 12 months after	Number and location of survey transects is TBD	N/A	N/A

Additional Post-Implementation Monitoring

Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Evaluation Criteria	Potential Corrective Action(s)
Sea turtle nesting	Prevent impediments to turtles and beach-dwelling fauna	Sea turtle surveys	Daily from May through October for 3 years post-placement	Entire deposition area	False crawls frequency and sea turtle nesting success	Confirm escarpments and sand compaction do not exceed limits; mitigate if needed
Height and length of escarpments	To identify barriers to turtle movement	Measure with tape measure	Every 2 weeks during turtle nesting season for three years	Entire deposition area	Less than 18 inches high and less than 100 feet long[66]	Remove/flatten escarpment (e.g., with tractor or shovels)[66]
Sand compaction (pounds per square inch)	To identify impediments to turtle movement	Cone penetrometer	Every 2 weeks during turtle season for 3 years	In deposition area at 500-foot intervals, approximately 2 stations per interval, and approximately 3 depths per station[66]	Less than 500 pounds per square inch[66]	Till with tractor[66]

[66] Sand escarpments and compaction would be monitored as required by the U.S. Fish and Wildlife Service Biological Opinion for the Pensacola Navigation Channel Maintenance Project (2010). Performance criteria and corrective actions are further described in the biological opinion.

4 Monitoring Schedule

The schedule for project performance monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameters	Year 1 (Execution)	Year 2 (Post-execution)	Year 3 (Post-execution)	Year 4 (Post-execution)
Volume placed	x			
Area	x	x	x	x
Shoreline position	x	x	x	x
Elevation	x	x	x	x
Successful sea turtle nesting	x	x	x	x
Escarpment dimensions		x	x	x
Sand compaction		x	x	x

5 Evaluation

The FL TIG anticipates conducting an evaluation of the monitoring data collected (as described above) to help answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration 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?

6 Data Management

Data Description

Data collection would be compiled within 12 months after collection. To the extent practicable, all environmental and biological data generated during monitoring activities would be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then project-specific datasheets would be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs would be retained by DOI.

Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format. All field datasheets and notebook entries would be scanned to PDF files. Electronic data files should be named with the date on which the file was created and should 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 should be made and the original preserved.

All data would have properly documented Federal Geographic Data Committee/International Organization for Standardization (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, quality assurance and

quality control [QA/QC] procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents).

Data Review and Clearance

Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format. After transcription of the data, the electronic data sheets would be verified 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 would verify and validate MAM data and information and would ensure that all data are: i) entered or converted into agreed upon/commonly used digital format; ii) labeled with metadata following FGDC/ISO standards to the extent practicable and in accordance with Implementing Trustee agency requirements.

After all identified errors are addressed, data are considered to be QA/QC'ed. The Implementing Trustee would give the other FL TIG members time to review the data before making such information publicly available (as described below).

Data Storage and Accessibility

Once all data has been QA/QC'ed it would be submitted to the Restoration Portal. Trustees would provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than 1 year from when data are collected.

Data Sharing

Data would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Explorer Interface within 1 year of when the data collection occurred.

7 Reporting

All reporting would occur after field surveys are completed annually. This report would summarize the findings for the sampling period including all worksheets transferred into digital format and presented in tabular and graphical formats. The data should be summarized in such a way that it is meaningful to the reader. Additionally, an annual report would be completed that includes:

- Summary data –synthesized data for all efforts during the year.
- Graphics, if applicable, and associated interpretations of the data.
- Comparisons of pre- and post-project conditions, as applicable.
- Any uncertainties with management actions.
- Potential data collection issues.
- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Data would be reviewed and submitted to the Restoration Portal by DOI U.S. Fish and Wildlife Service project personnel.

FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits: Monitoring and Adaptive Management

Prepared by: U.S. Department of the Interior (DOI)

Draft Version Date: 1/7/2021

1 Introduction

This project monitoring and adaptive management (MAM) plan identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the restoration project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degree of uncertainty, this project-specific MAM plan is scaled according to level of uncertainty, scope, scale, and Restoration Type associated with this project.

This MAM plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this document would be made publicly available through the Trustee Council Restoration Portal (www.diver.orr.noaa.gov/web/guest/home) and accessible through the *Deepwater Horizon* (DWH) Natural Resource Damage Assessment (NRDA) Trustees website (www.restoration.noaa.gov/dwh/storymap/).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS).

- Programmatic Goal: Restore and Conserve Habitat
- Restoration Type: Habitat Projects on Federally Managed Lands
- Restoration Approach: Restore and enhance dunes and beaches
- Restoration Technique: Enhance dune and beach habitat through replacing light fixtures
- TIG: Florida Trustee Implementation Group (FL TIG)
- Restoration Plan: Restoration Plan #2

This restoration project is being implemented within the Gulf Islands National Seashore (GUIS), Florida district, Fort Pickens area. The project includes restoration actions to enhance beach and dune habitat at GUIS by replacing light fixtures along Fort Pickens Road that cause light pollution and disorientation of wildlife.

Anthropogenic light sources along beaches and coasts can have negative impacts on the nocturnal behaviors of both nesting sea turtles and hatchlings. Lighting can affect nest site selection, can disorient nesting turtles returning to the sea, and can interfere with the ability of hatchlings to find the ocean. The emergence from the nest and crawl to the sea is one of the most vulnerable periods of a sea turtle's life. Hatchlings disoriented by artificial light may become dehydrated and are more exposed to ghost crabs, birds, and other predators.

Turtle-friendly lighting projects reduce light pollution, thereby reducing disorientation and increasing the number of hatchlings reaching the sea. Reducing beachfront lighting is consistent with turtle

recovery plans; light pollution has been identified as one of the most significant threats to recovery of loggerheads. Lighting management is also a high-priority conservation action needed for green turtle (*Chelonia mydas*) recovery.

This project would reduce sea turtle nesting disorientation and enhance nesting beach habitat quality in Escambia County and GUIS-managed lands by retrofitting streetlights along Fort Pickens Road with new wildlife-friendly amber light-emitting diode (LED) fixtures. These beaches provide nesting habitat for sea turtle species, including loggerhead (*Caretta caretta*), green, Kemp's ridley (*Lepidochelys kempii*), and leatherback (*Dermochelys coriacea*), and other beach-dwelling species. The intention of the new lighting is to reduce sea turtle disorientations along the project beaches as a result of light pollution, as well as increase energy efficiency and pedestrian safety along the Fort Pickens Road multi-use path.

This project is complimentary to the DWH NRDA *Improving Habitat Injured by Spill Response: Restoring the Night Sky* project that retrofitted Casino Beach parking lot on Pensacola Beach and arterial roads on State Hwy 399 east of Casino Beach. These retrofits benefitted sea turtle nesting habitat in the Santa Rosa Island Unit of GUIS. This project would benefit the nesting beaches in the Fort Pickens Unit of GUIS.

The implementing agency is the DOI, in coordination with Escambia County and Gulf Power.

Restoration Type Goals and Project Restoration Objectives

The overall goals for this Restoration Type relevant to this project, as identified in the PDARP/PEIS, are:

- Restore federally managed habitats that were affected by the oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats.
- Restore for injuries to federally managed lands by targeting restoration on federal lands where the injuries occurred, while considering approaches that provide resiliency and sustainability.
- Ensure consistency with land management plans for each designated federal land and its purpose by identifying actions that account for the ecological needs of these habitats.

The project restoration objectives are:

- Reduce light pollution and enhance the beach and dune habitat in sea turtle nesting areas within the project area by removing approximately 170 sodium light fixtures along 2 miles of road and installing 170+ new Florida Fish and Wildlife Conservation Commission (FWC)-certified wildlife-friendly amber LED fixtures.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 990.55(b)(1)(vii)). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

Potential Sources of Uncertainty

Potential uncertainties that may affect the success of this project are described below.

Table 1-1 Potential Uncertainties

Uncertainty	Summary of Resolution Strategy
LED fixtures do not eliminate disorientation as expected.	Compare photometrics after installation of LED fixtures with results from other similar projects that have been successful. Conduct a nighttime survey to determine whether any light or glow is visible directly or indirectly from the beach. Consider alternative fixtures for replacement.
Catastrophic weather affects nest success.	Storms and related surge can inundate and erode nests, causing partial or complete failure unrelated to disorientation.

Conceptual Model, Anticipated Outcomes and Future Activities

The conceptual model, described below, forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities and the desired project outcomes. The proposed restoration activities would provide benefits to sea turtles at GUIS by reducing light pollution through light retrofits along Fort Pickens Road.

Table 1-2 Conceptual Model

Activity	Output	Short-term outcome	Long-term outcome
Replace approximately 170 sodium light fixtures along 2 miles of road with FWC-certified wildlife-friendly amber LED fixtures using existing poles and power infrastructure.	New LED fixtures installed.	Reduction in light reaching the beach in an effort to reduce disorientation of sea turtle females and hatchlings; maintained or increased nesting.	Reduction in light reaching the beach in an effort to increase survivorship of sea turtles and recruitment to breeding population.

2 Adaptive Management

As noted above, there is some uncertainty related to whether disorientation of sea turtle females and hatchlings would be reduced following project implementation. To adaptively manage this project, and increase the likelihood of achieving the project objective, DOI project personnel would conduct targeted monitoring and use the monitoring data to refine future management actions.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed.

Information on each monitoring parameter is provided below, organized by objective or additional post-implementation monitoring. The list of corrective actions provided is not exhaustive; rather, it includes a list of potential actions to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective: Reduce light pollution and enhance the beach and dune habitat in sea turtle nesting areas within the project area by removing approximately 170 sodium light fixtures along 2 miles of road and installing 170+ new FWC-certified wildlife-friendly amber LED fixtures.

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Number of sodium light fixtures replaced with LED fixtures	Monitor progress toward objective	Descriptive reporting with map and photos	Quarterly, Annually	N/A	Installation in accordance with contract	Review project expectations with staff or contractor
Photometrics and nighttime visual survey of lighting	Ensure that new LED fixtures perform as expected	Standard photometer, nighttime visual survey along beach	Once prior to replacement and once after replacement. Similar time of night after astronomical twilight, on night with similar cloud cover and moon phase	3 sites along affected area	Wavelength of emitted light and intensity meet FWC standards after installation; nighttime visual survey confirms that no light or glow is visible directly or indirectly from the beach	Compare with other similar projects that have been successful. Consider alternative fixtures for replacement

Additional Pre- and Post-Implementation Monitoring Collected Outside of Project Funds

Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Evaluation Criteria	Potential Corrective Action(s)
Percentage of sea turtles disoriented along project nesting beaches	Confirm effectiveness of lighting retrofits	Standard Index Nesting Beach Survey protocol from FWC throughout entire nesting season; includes female emergence and nest monitoring	Annual reporting as required by FWC; Surveys throughout each nesting season 1 year prior to replacement and then for 2 years following fixture replacement	All crawls, nesting attempts, and nests located in project nesting beaches each season	Decrease in percentage of female emergences and nests that are affected by disorientation along project nesting beaches from season prior to replacement to 2 seasons after replacement	Compare photometrics after installation with other similar projects that have been successful. Consider alternative fixtures for replacement

4 Monitoring Schedule

The schedule for project performance monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameters	Year 1	Year 2 (As-built)	Year 3	Year 4
Number of sodium light fixtures replaced with LED fixtures		X		
Photometrics	X	X		
Percentage of sea turtles disoriented	X	X	X	X

5 Evaluation

The FL TIG anticipates conducting an evaluation of the monitoring data collected (as described above) to help answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration 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?

6 Data Management

Data Description

Data collection would be compiled within 12 months after collection. To the extent practicable, all environmental and biological data generated during monitoring activities would be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then project-specific datasheets would be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs would be retained by DOI.

Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format. All field datasheets and notebook entries would be scanned to PDF files. Electronic data files should be named with the date on which the file was created and should 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 should be made and the original preserved.

All data would have properly documented Federal Geographic Data Committee/International Organization for Standardization (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, quality assurance/quality control [QA/QC] procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents).

Data Review and Clearance

Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format. After transcription of the data, the electronic data sheets would be verified 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 would verify and validate MAM data and information and would ensure that all data are: i) entered or converted into agreed upon/commonly used digital format; ii) labeled with metadata following FGDC/ISO standards to the extent practicable and in accordance with DOI requirements.

After all identified errors are addressed, data are considered to be QA/QC'ed. The Implementing Trustee would give the other TIG members time to review the data before making such information publicly available (as described below).

Data Storage and Accessibility

Once all data has been QA/QC'ed it would be submitted to the Restoration Portal. Trustees would provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than 1 year from when data are collected.

Data Sharing

Data would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Explorer Interface within 1 year of when the data collection occurred.

7 Reporting

All reporting would occur after field surveys are completed annually. This report would summarize the findings for the sampling period including all worksheets transferred into digital format and presented in tabular and graphical formats. The data should be summarized in such a way that it is meaningful to the reader. Additionally, an annual report would be completed that includes:

- Summary data –synthesized data for all efforts during the year.
- Graphics, if applicable, and associated interpretations of the data.
- Comparisons of pre- and post-project conditions, as applicable.
- Any uncertainties with management actions.
- Potential data collection issues.
- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Data would be reviewed and submitted to the Restoration Portal by DOI U.S. Fish and Wildlife Service project personnel.

FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass: Monitoring and Adaptive Management Plan

Prepared by: U.S. Department of the Interior (DOI)

Draft Version Date: 1/7/2021

1 Introduction

This project monitoring and adaptive management (MAM) plan identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the restoration project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degree of uncertainty, this project-specific MAM plan is scaled according to level of uncertainty, scope, scale, and Restoration Type associated with this project.

This MAM plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this document would be made publicly available through the Trustee Council Restoration Portal (www.diver.orr.noaa.gov/web/guest/home) and accessible through the *Deepwater Horizon* (DWH) Natural Resource Damage Assessment (NRDA) Trustees website (www.restoration.noaa.gov/dwh/storymap/).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS).

- Programmatic Goal: Restore and Conserve Habitat; Provide and Enhance Recreational Opportunities
- Restoration Type: Habitat Projects on Federally Managed Lands; Provide and Enhance Recreational Opportunities
- Restoration Approaches: Protect and conserve marine, coastal, estuarine, and riparian habitats; Enhance public access to natural resources for recreational use
- Restoration Technique: Acquire lands for conservation; Enhance recreational infrastructure
- TIG: Florida Trustee Implementation Group (FL TIG)
- Restoration Plan: Restoration Plan #2

This restoration project would acquire and enhance a 10-15-acre parcel of land at Indian Pass. This acquisition would ensure important boat access to the St. Vincent Island portion of the St. Vincent National Wildlife Refuge (SVNWR) for research and management purposes. In addition, the project would enhance access to recreational opportunities by expanding parking at the existing boat ramp, converting the campground store to a visitor contact station, and establishing a kayak launch area with associated parking. These improvements would enhance public access to St. Vincent Island as well as improve visitor education about wildlife resources on SVNWR and compatible recreational opportunities.

The co-implementing agencies are the FWC and DOI, in coordination with SVNWR staff, Gulf County, and Friends of SVNWR.

Restoration Type Goals and Project Restoration Objectives

The overall goals for this Restoration Type relevant to this project, as identified in the PDARP/PEIS, are:

- Restore federally managed habitats that were affected by the oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats.
- 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 project restoration objectives are:

- Acquire 10-15 acres of land at Indian Pass, ensuring boat access to St. Vincent Island into the future
- Increase public access to recreational activities, such as fishing and boating, by increasing parking availability, establishing a kayak launch area, and creating a visitor contact station at SVNWR

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 990.55(b)(1)(vii)). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

Potential Sources of Uncertainty

Project uncertainties have the potential to reduce the likelihood of the goals and objectives of this project being fully achieved in a timely manner. Corrective actions may be necessary to address uncertainties and maximize project benefits. Here we address some uncertainties that were considered during project planning. This list should not be considered exhaustive; additional uncertainties could be identified as the project is implemented and monitored.

Acquisition of the land parcel would require due diligence prior to the sale, including a professional appraisal, a boundary survey, a Level 1 contaminants survey. The landowner would have to be willing to sell the parcel at the fair market value determined by the appraisal. Depending on the outcomes of the appraisal and the contaminants survey, the sale may not be approved to proceed, and the entire project would have to be abandoned.

If the land parcel is acquired, the ability of SVNWR to complete the public access improvements may be disrupted by outside forces such as catastrophic weather (e.g., hurricanes). Delays in the schedule for making improvements may occur and would be acceptable. During planning for this 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. If public interest in the recreational activities is not realized, corrective actions such as public outreach may be warranted.

Conceptual Model, Anticipated Outcomes and Future Activities

The conceptual model, described below, forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities, and the desired project outcomes. The proposed restoration activities would provide benefits to habitats and natural resources by ensuring access to SVNWR for research and management purposes through the acquisition of a land parcel and boat dock. Additionally, the proposed activities would provide benefits to the public through the addition of recreational use amenities.

Table 1-1 Conceptual Model

Activity	Output	Short-term outcome	Long-term outcome
Acquire land parcel	Secure access to SVNWR; Allow for improvement of facilities	Continued access to SVNWR	Additional projects implemented on SVNWR due to ease of access; Cost savings from no longer needing to lease the boat slip
Improve parking and create kayak launch area	Increased number of parking spaces, access for kayaks	Increased access to recreational activities	Increased access to recreational activities
Convert existing building into visitor contact station	Creation of first visitor contact station with the island within view for SVNWR	Improved visitor education about wildlife resources on SVNWR and compatible recreational opportunities	Improved visitor education about wildlife resources on SVNWR and compatible recreational opportunities

2 Adaptive Management

As noted above, there is some uncertainty related to whether reductions in human impacts would occur after project implementation. To adaptively manage this project, and increase the likelihood of achieving the project objective, DOI project personnel would conduct targeted monitoring and use the monitoring data to refine future management actions.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed.

Information on each monitoring parameter is provided below, organized by objective. The list of corrective actions provided below is not exhaustive; rather, it includes a list of potential actions to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Acquire 10-15 acres of land at Indian Pass, ensuring boat access to St. Vincent Island into the future.

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Area	Verify acquisition of parcel	Acreage listed in executed acquisition documents	Once upon completion of acquisition process	N/A	Executed acquisition documents	N/A

Objective 2: Increase public access to recreational activities, such as fishing and boating, by increasing parking availability, establishing a kayak launch area, and creating a visitor contact station at SVNWR.

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Completion of improvements related to recreational amenities	To increase recreational opportunities	Tracking of tasks as outlined in all pertinent contracts and communications	Quarterly, Annually	N/A	Completion of tasks as outlined in all pertinent contracts and communications	Remedy any inconsistencies in execution via project manager
Visitor use/access	To estimate the number of members of the public using the enhanced facilities	Visual surveys (performed by SVNWR staff or through automated counters)	2 days per week and 2 weekend days per month for 6 months prior to, and 2 years following, completion of improvements; monitored days should not be holiday weekends	Approximately 60 counts prior to and approximately 128 counts following completion of improvements; location of visual surveys would focus on enhanced facilities located on acquired parcel	Increase in use following completion of improvements	Surveys of visitors or community members to understand lack of use

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Visitor use/access	To estimate the number of members of the public using the enhanced facilities	Parking lot counts (performed by SVNWR staff or through automated counters)	For visual observations, 2-week days per week and 2 weekend days per month for 6 months prior to, and 2 years following, completion of improvements; monitored days should not be holiday weekends	Approximately 60 counts prior to and approximately 128 counts following completion of improvements; parking lot counts would occur in all parking lots associated with the acquired parcel	Increase in use following completion of improvements	Surveys of visitors or community members to understand lack of use
Visitor use/access	To estimate the number of members of the public using the visitor center	Visitor center counts (performed by SVNWR staff or through automated counters)	2-week days per week and two weekend days per month for 2 years following, completion of improvements; weekend data would be contingent on staffing of visitor center; holiday weekends may be included in monitoring, as additional data	Approximately 128 counts; number of counts may exceed this value if/when holiday weekends are included	Increase in use following completion of improvements	Surveys of visitors or community members to understand lack of use

4 Monitoring Schedule

The schedule for project performance monitoring is shown in Table 3 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameters	Year 1	Year 2	Year 3	Year 4	Year 5
Area		X			
Completion of improvements related to recreational amenities			X		
Visitor use/access	X	X	X	X	X

5 Evaluation

The FL TIG anticipates conducting an evaluation of the monitoring data collected (as described above) to help answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration 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?

6 Data Management

Data Description

Data collection would be compiled within 12 months after collection. To the extent practicable, all data generated during monitoring activities would be documented using standardized datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then project-specific datasheets would be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs would be retained by DOI or FWC.

Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format. All datasheets and notebook entries would be scanned to PDF files. Electronic data files should be named with the date on which the file was created and should 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 should be made and the original preserved.

All data would have properly documented Federal Geographic Data Committee/International Organization for Standardization (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, quality assurance/quality control [QA/QC] procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents).

Data Review and Clearance

Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format. After transcription of the data, the electronic data sheets would be verified 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 would verify and validate MAM data and information and would ensure that all data are: i) entered or converted into agreed upon/commonly used digital format; ii) labeled with metadata following FGDC/ISO standards to the extent practicable and in accordance with DOI requirements.

After all identified errors are addressed, data are considered to be QA/QC'ed. DOI or FWC would give FL TIG members time to review the data before making such information publicly available (as described below). Before submitting the monitoring data and information package, co-Implementing Trustees shall confirm with one another that the package is approved for submission.

Data Storage and Accessibility

Once all data has been QA/QC'ed it would be submitted to the Restoration Portal. Trustees would provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than 1 year from when data are collected.

Data Sharing

Data would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Explorer Interface within 1 year of when the data collection occurred.

7 Reporting

All reporting would occur after surveys are completed annually. This report would summarize the findings for the sampling period including all worksheets transferred into digital format and presented in tabular and graphical formats. The data should be summarized in such a way that it is meaningful to the reader. Additionally, an annual report would be completed that includes:

- Summary data –synthesized data for all efforts during the year.
- Graphics, if applicable, and associated interpretations of the data.
- Comparisons of pre- and post-project conditions, as applicable.
- Any uncertainties with management actions.
- Potential data collection issues.
- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Data would be reviewed and submitted to the Restoration Portal by DOI U.S. Fish and Wildlife Service project personnel.

ST1, Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS; DWH NRDA Trustees, 2016a) and the Strategic Framework for Sea Turtle Restoration Activities (DWH NRDA Trustees, 2017), and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (Standard Operating Procedures Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the PDARP/PEIS.

- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type: Sea Turtles
- Restoration Approach: Reduce sea turtle bycatch in recreational fisheries through development and implementation of conservation measures (PDARP/PEIS Section 5.5.10.2; DWH NRDA Trustees, 2016a)
- Restoration Technique: Evaluate, develop, and implement conservation measures to reduce bycatch in pier- and shore-based recreational fisheries (Strategic Framework for Sea Turtle Restoration Activities; Module 4, Section 2.2.4)

This restoration project is being implemented at eight fishing piers across seven Florida Gulf Coast counties: Pensacola Beach Pier (Escambia County), Navarre Beach Pier (Santa Rosa County), Fort Walton Beach Pier (Okaloosa County), MB Miller County Pier and Russell-Fields City Pier (Bay County), Clearwater Beach Pier (Pinellas County), Venice Pier (Sarasota County), and Naples Pier (Collier County). This project includes restoration actions to reduce sea turtle injury and mortality from incidental hookings in recreational fisheries by 1) collating existing information on sea turtle incidental captures, 2) documenting existing conditions at the eight fishing piers, 3) establishing state observers at the eight fishing piers, 4) developing a FWC Sea Turtle Incidental Hooking and Capture Plan (the Plan) based on collected information, and 5) voluntarily implementing the Plan at various fishing piers. This project

would directly benefit sea turtles by reducing sea turtle injury and mortality from incidental hooking events.

The implementing agency is FWC. Project partners may include local governments, who oversee the majority of fishing piers along the Florida Gulf Coast; Florida Department of Environmental Protection, who manages submerged lands leases for piers; federal government agencies (e.g., the National Oceanic and Atmospheric Administration); and participants in the existing FWC Marine Turtle Permit Holder program which includes all Florida sea turtle rehabilitation facilities, sea turtle veterinarians, and stranding response personnel.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goals relevant to this project, as identified in the PDARP/PEIS, are:

- Restore injuries by addressing primary threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (e.g., cold water temperatures), loss or degradation of nesting beach habitat (e.g., coastal armoring and artificial lighting), and other anthropogenic threats.
- Support existing conservation efforts by ensuring consistency with recovery plans and recovery goals for each of the sea turtle species.

The restoration objective for this project is:

- Reduce incidental capture of sea turtles at fishing piers and improve outcomes for hooked and captured sea turtles, ultimately reducing overall mortality.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Reduce incidental capture of sea turtles at fishing piers and improve outcomes for hooked and captured sea turtles, ultimately reducing overall mortality.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Conservation or Improvement Measures (multiple)	Monitor progress toward meeting restoration objective	FWC would collect data on the number of sites assessed (e.g., number of target fishing piers where work was implemented), number of observers on target fishing piers, and number of anglers surveyed	Annually compiled during project implementation following initiation of relevant project activities	40: annually for 5 years on 8 fishing piers: Pensacola Beach Pier, Navarre Beach Pier, Fort Walton Beach Pier, MB Miller County Pier, Russell-Fields City Pier, Clearwater Beach Pier, Venice Pier, and Naples Pier	An increase in conservation measures on target fishing piers	Encourage implementation of the Sea Turtle Incidental Hooking and Capture Plan (if available)
Core: Equipment (multiple)	Monitor progress toward meeting restoration objective	FWC staff would collect data on equipment (e.g., number acquired, purchased, distributed, installed, or used such as dehooking equipment, signs, or nets for capture)	Annually compiled during project implementation following initiation of relevant project activities	40: annually for 5 years on eight fishing piers (see above)	An increase in necessary equipment to reduce incidental captures of turtles on target fishing piers	Encourage implementation of the Sea Turtle Incidental Hooking and Capture Plan (if available)
Core: Educational Trainings or Materials (multiple)	Monitor progress toward meeting restoration objective	FWC staff would collect data on educational opportunities or materials (e.g., number/type of trainings offered, individuals trained, outreach materials distributed, number of new signs posted, percent of piers with	Annually compiled during project implementation following initiation of relevant project activities	40: annually for 5 years on 8 fishing piers (see above)	An increase in educational opportunities or information to reduce incidental captures of	Encourage implementation of the Sea Turtle Incidental Hooking and Capture Plan (if available)

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
		signage and reporting, materials available, and survey outcomes			turtles on target fishing piers	
Objective specific: Incidental Captures (multiple)	Monitor progress toward meeting restoration objective	FWC staff would evaluate data compiled through standard reporting procedures (e.g., Florida's Sea Turtle Stranding and Salvage Network and rehabilitation facilities). Staff would determine the number of turtles hooked but not landed and incidental captures (number reported and responses for turtles if captured or not, e.g., with hook-and-line gear injuries), and the proportion of positive outcomes of captured turtles (e.g., duration in rehabilitation, final outcome)	Annually compiled during project implementation following initiation of relevant project activities	40: annually for 5 years on 8 fishing piers (see above)	A decrease in the number of hooked and captured turtles on target fishing piers and/or an increase in the percent of positive outcomes of captured turtles	Encourage implementation of the Sea Turtle Incidental Hooking and Capture Plan (if available)

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Conservation or Improvement Measures	N/A	X	N/A
Equipment	N/A	X	N/A
Incidental Captures	N/A	X	N/A
Educational Trainings or Materials	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWC staff would compile data throughout the calendar year, synthesize the results according to monitoring parameters above, and send the data and a draft annual monitoring report to FWC DWH staff within 2 months of the calendar year ending. FWC DWH staff would quality assure/quality control (QA/QC) the monitoring data and annual report and coordinate with project staff should any changes be necessary. After all identified errors are addressed, the monitoring data and annual report would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review the monitoring data and annual report before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data and annual report would be stored in the DIVER Restoration Portal. The data and report would be submitted by FWC within 4 months of the calendar year ending.

Data Sharing

The monitoring data and annual report would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 6 months of the calendar year ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

DWH NRDA Trustees. 2017. *Deepwater Horizon* Oil Spill Natural Resource Damage Assessment: Strategic Framework for Sea Turtle Restoration Activities Version 1. June. Available: www.gulfspillrestoration.noaa.gov/2017/06/trustees-release-strategic-frameworks-restoration.

ST2, Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS; *Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees, 2016a) and the Strategic Framework for Sea Turtle Restoration Activities (DWH NRDA Trustees, 2017), and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (Standard Operating Procedures Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the PDARP/PEIS.

- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type: Sea Turtles
- Restoration Approach: Increase sea turtle survival through enhanced mortality investigation, and early detection of and response to anthropogenic threats and emergency events (PDARP/PEIS Section 5.5.10.2; DWH NRDA Trustees, 2016a)
- Restoration Technique: Reduce marine debris (Strategic Framework for Sea Turtle Restoration Activities; Module 4, Section 2.2.6)

This restoration project is being implemented within the coastal nearshore environment along Florida's Gulf Coast (Escambia to Monroe County). This project includes restoration actions to reduce the risk of sea turtle entanglement in, entrapment in, or ingestion of marine debris (with a focus on in-water derelict fishing gear) by 1) identifying marine debris hotspot through data compilation and analysis, 2) removing existing in-water marine debris, 3) increasing methods for fishing gear collection and disposal, and 4) providing education and outreach to local communities. This project would directly benefit sea turtles by reducing sea turtle injury and mortality from marine debris

The implementing agency is FWC. Project partners may include Gulf Coast-based non-governmental organizations (e.g., Ocean Aid 360, Clearwater Marine Aquarium, Sarasota Bay Watch, Apalachicola

Riverkeeper), local, state, and federal partners (e.g., National Oceanic and Atmospheric Administration, U.S. Environmental Protection Agency, Florida Department of Environmental Protection, county-managed piers, marinas, bridges), and educational institutions/university-based programs (e.g., University of Florida, Florida Sea Grant).

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goals relevant to this project, as identified in the PDARP/PEIS, are:

- Restore injuries by addressing primary threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (e.g., cold water temperatures), loss or degradation of nesting beach habitat (e.g., coastal armoring and artificial lighting), and other anthropogenic threats.
- Support existing conservation efforts by ensuring consistency with recovery plans and recovery goals for each of the sea turtle species.

The restoration objective for this project is:

- Reduce the threat and impacts (e.g., entanglement, entrapment, and/or ingestion) of marine debris to sea turtles, with a primary focus on in-water derelict fishing gear (e.g., monofilament fishing line, nets, trap/pot gear, and other recreational/commercial fishing equipment that has been lost, abandoned, or discarded).

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Reduce the threat and impacts (e.g., entanglement, entrapment, and/or ingestion) of marine debris to sea turtles, with a primary focus on in-water derelict fishing gear (e.g., monofilament fishing line, nets, trap/pot gear, and other recreational/commercial fishing equipment that has been lost, abandoned, or discarded).

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Objective specific: Identification/Selection of Hotspots (multiple)	Monitor progress toward meeting restoration objective	FWC would document the process and outcome of identifying and selecting marine debris hotspots targeted for implementation	Collected during all relevant project activities and annually compiled during project implementation (Years 1-7)	Collected during all relevant project activities (up to 16 hotspots, locations to be determined [TBD])	Identification of marine debris hotspots that impact or have the potential to impact sea turtles	N/A
Objective specific: Derelict Debris Removals or Cleanups (multiple)	Monitor progress toward meeting restoration objective	FWC would collect data during all removal events including number of events, number of people involved (e.g., volunteers), and the type and amount of debris removed.	Collected during all removal events and annually compiled during project implementation (Years 2-7)	Collected during all removal events (number and locations TBD).	Removal of marine debris in sea turtle habitat	N/A
Core: Equipment (multiple)	Monitor progress toward meeting restoration objective	FWC would collect data on equipment purchased, distributed, installed, or in use for removals and prevention activities (e.g., increasing methods and capacity for fishing gear collection and disposal such as monofilament recycling bins, arrangement of maintenance services, and	Collected during all relevant project activities and annually compiled during project implementation (Years 2-7)	Collected during all relevant project activities (up to 16 hotspots, locations TBD)	An increase in necessary equipment to remove/ prevent marine debris in sea turtle habitat	N/A

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
		expanding sustainable disposal options)				
Core: Area (acres)	Monitor progress toward meeting restoration objective	FWC would determine the number of acres protected, conserved, or restored as a result of removal and prevention activities	Collected during all relevant project activities and annually compiled during project implementation (Years 2-7)	Collected during all relevant project activities (up to 16 hotspots, locations TBD)	An increase in acreage of turtle habitat protected, conserved, restored, or evaluated for marine debris impacts	N/A
Core: Educational Trainings or Materials (multiple)	Monitor progress toward meeting restoration objective	FWC would collect data on the number of presentations/ trainings offered, individuals present, and type/number of outreach materials distributed, including signage	Collected during all relevant project activities and annually compiled during project implementation (Years 2-7)	Collected during all relevant project activities (up to 16 hotspots, locations TBD)	An increase in educational opportunities and/or information on marine debris impacts	N/A

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Identification/Selection of Hotspots	X	N/A	N/A
Derelict Debris Removals or Cleanups	N/A	X	N/A
Equipment	N/A	X	N/A
Area	N/A	X	N/A
Educational Trainings or Materials	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management (MAM Manual Section 2.4.8)

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWC would compile data throughout the calendar year, synthesize the results according to monitoring parameters above, and send the data and a draft annual monitoring report to FWC DWH staff within 2 months of the calendar year ending. FWC DWH staff would quality assure/quality control (QA/QC) the monitoring data and annual report and coordinate with project staff should any changes be necessary. After all identified errors are addressed, the monitoring data and annual report would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review the monitoring data and annual report before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data and annual report would be stored in the DIVER Restoration Portal. The monitoring data and annual report would be submitted by FWC within 4 months of the calendar year ending.

Data Sharing

The monitoring data and annual report would be made publicly available, in accordance with Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 6 months of the calendar year ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

DWH NRDA Trustees. 2017. *Deepwater Horizon* Oil Spill Natural Resource Damage Assessment: Strategic Framework for Sea Turtle Restoration Activities Version 1. June. Available: www.gulfspillrestoration.noaa.gov/2017/06/trustees-release-strategic-frameworks-restoration.

ST3, Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS; *Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees, 2016a) and the Strategic Framework for Sea Turtle Restoration Activities (DWH NRDA Trustees, 2017), and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (SOP Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the PDARP/PEIS.

- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type: Sea Turtles
- Restoration Approach: Reduce injury and mortality of sea turtles from vessel strikes (PDARP/PEIS Section 5.5.10.2; DWH NRDA Trustees, 2016a)
- Restoration Technique (Strategic Framework for Sea Turtle Restoration Activities; Module 4, Section 2.2.7): Enhanced understanding of the temporal and spatial distribution of vessel strikes, and variables that may influence the frequency of vessel strikes

This restoration project is being implemented within three passes along the Florida Gulf Coast: East Pass (Walton County), Blind Pass (Pinellas County), and San Carlos Bay Entrance (Lee County). This project includes restoration actions to reduce the risk of vessel strikes to sea turtles by 1) compiling and analyzing existing data on vessel strikes, 2) collecting additional data at the three Florida Gulf Coast passes, 3) conducting boater surveys, and 4) conducting a public awareness campaign to encourage responsible boating practices. By improving public awareness of sea turtle vessel-strike incidents, this project may increase responsible boating practices and in turn reduce injury and mortality caused by vessel strikes.

The implementing agency is FWC in partnership with Florida State University.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goals relevant to this project, as identified in the PDARP/PEIS, are:

- Restore injuries by addressing primary threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (e.g., cold water temperatures), loss or degradation of nesting beach habitat (e.g., coastal armoring and artificial lighting), and other anthropogenic threats.
- Support existing conservation efforts by ensuring consistency with recovery plans and recovery goals for each of the sea turtle species.

The restoration objective for this project is:

- Utilize compiled data to conduct a public awareness campaign to educate the public about sea turtles and the threat of vessel strikes and to promote responsible boating practices.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective: Utilize compiled data to conduct a public awareness campaign to educate the public about sea turtles and the threat of vessel strikes and to promote responsible boating practices.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Conservation or Improvement Measures (multiple)	Monitor progress toward meeting restoration objective	FWC would collect and compile data from the selected sites (e.g., compile data on sea turtles, quantify vessel use and activity, compile data on vessel strikes, and conduct boater surveys)	Annually complied during Years 1-3 of project implementation	9: annually for 3 years at project locations: East Pass, Blind Pass, and San Carlos Bay Entrance	Data is compiled to conduct a public awareness campaign	N/A
Core: Education / Outreach (multiple)	Monitor progress toward meeting restoration objective	Florida Fish and Wildlife Research Institute (FWRI) staff would collect data on the number and type of educational opportunities, individuals educated, and outreach materials distributed. Specifically, staff would collect data on 1) the number and outcome of people surveyed to solicit opinions on sea turtle mortality from vessel strike injuries and potential conservation measures and 2) the	Annually compiled during project implementation following initiation of education/ outreach activities (Years 4-5)	6: annually for 2 years at 3 project locations: East Pass, Blind Pass, and San Carlos Bay Entrance	An increase in educational opportunities in the project area related to vessel strikes	N/A

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
		number and method of people educated on sea turtle distribution and behavior and ways to reduce the chances of striking a turtle				

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Conservation or Improvement Measures	N/A	X	N/A
Education/Outreach	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWRI staff would compile data throughout the calendar year, synthesize the results according to monitoring parameters above, and send the data and a draft annual monitoring report to FWC DWH staff within 2 months of the calendar year ending. FWC DWH staff would quality assure/quality control [QA/QC] the monitoring data and annual report and coordinate with project staff should any changes be necessary. After all identified errors are addressed, the monitoring data and annual report would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review the monitoring data and annual report before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data and annual report would be stored in the DIVER Restoration Portal. Data would be submitted by FWC within 4 months of the calendar year ending.

Data Sharing

The monitoring data and annual report would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 6 months of the calendar year ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

DWH NRDA Trustees. 2017. *Deepwater Horizon* Oil Spill Natural Resource Damage Assessment: Strategic Framework for Sea Turtle Restoration Activities Version 1. June. Available: www.gulfspillrestoration.noaa.gov/2017/06/trustees-release-strategic-frameworks-restoration.

MM1, Florida Gulf Coast Marine Mammal Stranding Network: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/29/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS; *Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees, 2016a) and the Strategic Framework for Marine Mammal Restoration Activities (DWH NRDA Trustees, 2017), and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects will have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan will be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (Standard Operating Procedures Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the PDARP/PEIS.

- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type: Marine Mammals
- Restoration Approach: Increase marine mammal survival through better understanding of causes of illness and death as well as early detection and intervention for anthropogenic and natural threats (PDARP/PEIS Section 5.5.11.2; DWH NRDA Trustees, 2016a)
- Restoration Techniques (Strategic Framework for Marine Mammal Restoration Activities; Module 4, Section 2.4):
    - Address gaps and enhance capacity in the current capabilities of the MMSN throughout the Northern Gulf of Mexico to improve timeliness of response, and diagnosis of illness and cause of death
    - Develop and increase the technical and infrastructure capabilities to respond to major stranding events or disasters
    - Improve the ability of strandings network partners to detect and rescue free-swimming marine mammals that are entangled, entrapped, or out of habitat

This restoration project is being implemented along Florida's Gulf Coast (Escambia to Monroe Counties). This project includes restoration actions to increase marine mammal survival by 1) providing support (e.g., personnel, equipment, training) to federally permitted Marine Mammal Stranding Network

(MMSN) organizations to rapidly respond to stranded marine mammals, 2) increasing data collecting, reporting, collaboration, and consistency, 3) increasing the MMSN's capacity to perform necropsies, and 4) increasing the MMSN's capacity to report to unusual natural or anthropogenic events. This project would directly benefit marine mammals by improving understanding of key causes of morbidity and mortality and improving the early detection and mitigation of anthropogenic or natural threats.

The implementing agencies are FWC and the National Oceanic and Atmospheric Administration (NOAA), in coordination with the National Marine Fisheries Service (NMFS). Other project partners include National Fish and Wildlife Foundation, Gulf World Marine Institute, Emerald Coast Wildlife Refuge, University of Florida, Clearwater Marine Aquarium, Mote Marine Laboratory, and Dolphins Plus Marine Mammal Responder.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goals identified in the PDARP/PEIS, are:

- Identify and implement actions that support ecological needs of the stocks; improve resilience to natural stressors; and address direct human-caused threats such as bycatch in commercial fisheries, vessel collisions, noise, industrial activities, illegal feeding and harassment, and hook-and-line fishery interactions.
- Identify and implement restoration activities that mitigate key stressors in order to support resilient populations. Collect and use monitoring information, such as population and health assessments and spatiotemporal distribution information.
- Implement an integrated portfolio of restoration approaches to restore injured bay, sound, and estuary, coastal, shelf, and oceanic marine mammals across the diver habitats and geographic ranges they occupy.

The restoration objective for this project is:

- Enhance MMSN capabilities to identify, characterize, and quantify marine mammal morbidity and mortality factors and provide conservation managers critical and timely information needed to inform effective actions and plans aimed at mitigating or eliminating threats to marine mammal species.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Conceptual Setting

The conceptual setting identifies factors and interactions that may influence project outcomes. This project would build upon established working relationships with individual MMSN organizations to bring consistent diagnostic capabilities, training, and data management, to the overall Gulf MMSN. Individual MMSN organizations would work closely with the project team to implement activities at the local level; however, participation in the MMSN and/or performance may be influenced by logistical and cost constraints. Other key factors could include the frequency and distribution of strandings, as well as changes to the Marine Mammal Protection Act (MMPA) or other regulatory frameworks/permitting processes.

Potential Sources of Uncertainty

Uncertainties or information gaps have the potential to affect adaptive management decisions for 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. Sources of uncertainty, the degree of uncertainty, and the level of uncertainty associated with projects varies. As this project relies on existing data to inform management decisions, there are a number of potential sources of uncertainty that could affect project performance and success, including:

- The progress of development and coordination/integration of marine mammal-related databases and data management.
- Changes in marine mammal activity and behavior in the future (e.g., responding to changing environmental conditions, human activities), leading to differences in the frequency and distribution of strandings.
- Timely public reporting of stranded animals.
- Changes to the MMPA or other regulatory frameworks/permitting processes.
- Similarities and differences in activities across current and future individual MMSNs (e.g., responding to changing administrations, support, economic activity).
- The number of carcasses with salvageable tissue samples.
- Emerging threats and diseases not yet identified.

This list should not be considered exhaustive; additional uncertainties may be identified as the project is implemented and/or monitored.

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 and Llewellyn 2000; Thom et al. 2005). Performance may be evaluated in terms of implementation of the project plan, expected project outputs, or the ability of the project to achieve the desired restoration outcomes.

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. An adaptive management approach would be taken to ensure that the data generated by enhanced stranding networks, as well as the improved capabilities and capacities of those MMSNs, is maintaining and/or improving marine mammal survival through improving the understanding of key causes of morbidity and mortality. The project team would use an iterative process to plan, evaluate, implement, and monitor activities so that the project can address the uncertainties inherent in ecological restoration of protected species and improve the ability to detect changes in the types and timing of natural and anthropogenic threats as quickly as possible. If project objectives are not being met, the Implementing Trustee will identify corrective actions as necessary and bring forward to the TIG for consideration.

4 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 4-1). Note that Table 4-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 4-1 Monitoring Parameters

Objective 1: Enhance MMSN capabilities to identify, characterize, and quantify marine mammal morbidity and mortality factors and provide conservation managers critical and timely information needed to inform effective actions and plans aimed at mitigating or eliminating threats to marine mammal species.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Other: MMSN Partners (multiple)	Monitor progress toward meeting restoration objective	Florida Fish and Wildlife Research Institute (FWRI) staff will collect data (numbers of partners/partnerships, and spatial/geographic coverage) on active MMSN partners to evaluate maintenance of MMSN capacity	Annually compiled and reported during project implementation (Years 1-5+)	5+: annually for 5+ years along the Florida Gulf Coast	Sustained reliability of MMSN capacity along the Florida Gulf Coast	Reduce the time to fill stranding position vacancies. Report on observed changes in stranding frequency or distribution
Core: Maintenance of MMSN Capacity (multiple)	Monitor progress toward meeting restoration objective.	FWRI staff will collect data (number and percent of trained personnel, number of equipment caches available, and sustained response coverage areas) on the ability of the MMSN to maintain the capacity to support response to live and dead stranded marine mammals and assist with mass stranding events/ UMEs.	Annually compiled and reported during project implementation (Years 1-5+)	5+: annually for 5+ years along the Florida Gulf Coast	Sustained reliability of MMSN capacity along the Florida Gulf Coast	Conduct debrief meetings of MMSN organizations to evaluate performance of major events

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Number/ Location of Animals (multiple)	Monitor progress toward meeting restoration objective	FWRI staff and the other MMSN partners will collect data during MMSN responses including the number and type of responses, number of successful responses to entangled, entrapped, or out-of-habitat animals requiring assessment or intervention, and the proportion of carcasses (code 2 and early 3) necropsied (partial or full).	Collected during all response events and annually compiled and reported during project implementation (Years 1-5+)	Collected during all response events (number and location to be determined).	Sustain the ability to respond to stranded marine mammals along the Florida Gulf Coast	Increase support for MMSN organizations

5 Monitoring Schedule

The schedule for project monitoring is shown in Table 5-1 by monitoring parameter.

Table 5-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
MMSN Partners	N/A	X	N/A
Maintenance of MMSN Capacity	N/A	X	N/A
Number/Location of Animals	N/A	X	N/A

6 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the MMSN able to maintain capacity, skills, and equipment needed to implement core parameters?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

7 Data Management

Data Description

See Table 4-1 above for details on how data will be recorded, the type of data that will be collected, the data standards that will be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWRI staff will compile data throughout the calendar year, synthesize the results according to monitoring parameters above, and send the data to FWC DWH staff within 2 months of the calendar year ending. FWC DWH staff, in consultation with FWRI staff and NOAA, will draft an annual monitoring report. FWC DWH staff will quality assure/quality control (QA/QC) the annual monitoring report and coordinate with project staff should any changes be necessary. All appropriate data will be entered into GulfMap or equivalent database for the information fields available in those databases on a monthly basis. After any and all identified errors are addressed, the report will be considered to be QA/QC'ed. FWC and NOAA will give the other FL TIG members time to review the annual monitoring report before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed annual monitoring report will be stored in the DIVER Restoration Portal. The monitoring report will be submitted by FWC within 4 months of the calendar year ending.

Data Sharing

The annual monitoring report will be made publicly available, in accordance with the Open Government Data Act, through the DIVER Restoration Portal within 6 months of the calendar year ending.

8 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

9 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

10 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for

Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

DWH NRDA Trustees. 2017. *Deepwater Horizon* Oil Spill Natural Resource Damage Assessment: Strategic Framework for Marine Mammal Restoration Activities Version 1. June. Available: www.gulfspillrestoration.noaa.gov/2017/06/trustees-release-strategic-frameworks-restoration.

B1, Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS; *Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees, 2016a) and the Strategic Framework for Bird Restoration Activities (DWH NRDA Trustees, 2017), and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (SOP Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the PDARP/PEIS.

- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type: Birds
- Restoration Approach: Restore and conserve bird nesting and foraging habitat (PDARP/PEIS Section 5.5.12.2; DWH NRDA Trustees, 2016a)
- Restoration Technique: Create or enhance oyster shell rakes and beds (PDARP/PEIS Appendix 5.D.6.1, Strategic Framework for Bird Restoration Activities; Module 4, Section 2.1)

This restoration project is being implemented at Gomez Key in Levy County, Florida. This project includes restoration actions to enhance bird nesting habitat by 1) placing material in the intertidal zone for oyster reef expansion and recolonization and 2) installing a native rock breakwater to reduce wave erosion. This project would directly benefit birds, specifically American oystercatchers (*Haematopus palliatus*), by integrating a combination of habitat restoration strategies to prevent erosion, increase sedimentation, promote oyster recolonization, and expand and elevate potential American oystercatcher nesting habitat.

The implementing agency is FWC.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goals relevant to this project, as identified in the PDARP/PEIS, are:

- Restore lost birds by facilitating additional production and/or reduced mortality of injured bird species.
- Restore or protect habitats on which injured birds rely.

The restoration objective for this project is:

- Restore and/or enhance critical American oystercatcher nesting and foraging habitat on Gomez Key to prevent further erosion and increase reproductive success.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Restore and/or enhance critical American oystercatcher nesting and foraging habitat on Gomez Key to prevent further erosion and increase reproductive success.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Area (acres)	Monitor progress toward meeting restoration objective	Florida Fish and Wildlife Research Institute (FWRI) staff, with assistance from University of Florida (UF), would use LiDAR to determine the number of acres and average elevation of existing (i.e., pre-restoration) American oystercatcher nesting and foraging habitat and the number of acres and average elevation of restored and/or enhanced habitat post-construction	Collected prior to construction (Year 2) and post-construction (Year 5), pending availability of the UF LiDAR team	2: annually for 2 years at Gomez Key	An increase in acreage and elevation of habitat restored and/or enhanced	N/A
Core: Bird abundance and/or density (count)	Monitor progress toward meeting restoration objective	FWRI staff would determine pre- and post-restoration American oystercatcher abundance and/or density (all age classes) using data from the Florida Shorebird Database, a central repository for data collected on shorebirds and seabirds in Florida using The Breeding Bird Protocol for Florida's Shorebirds and Seabirds. Data would include presence/absence or abundance of focal species, number of nesting pairs, reproductive success (e.g., number of nests, number of fledglings), survival (adults, juveniles, and/or chicks), number of nests protected, and/or nest location/ habitat preference(s) of nesting pairs	Collected prior to construction (Year 2) and post-construction (Year 5) according to FSA protocols	2: annually for 2 years at Gomez Key	An increase in abundance and/or density	N/A

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Objective-specific: Density of live and dead oysters (oysters/m^2)	Monitor progress toward meeting restoration objective	FWRI staff would determine pre- and post-restoration the number of live and dead individual oysters per square meter using methodologies outlined in Section E.3.17 of the MAM Manual Version 1.0	Collected prior to construction (Year 2) and post-construction (Year 5) after the growing season	2: annually for 2 years at Gomez Key	An increase in abundance, density, and live oysters in the project area	N/A
Objective specific: Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	Monitor progress toward meeting restoration objective	Review of contractor reports, on-site inspections, and comparison of construction to "as-built" drawings or other planning materials	Approximately monthly during construction and at the end of construction warranty period, unless otherwise provided by contract	At specific locations of construction; approximately monthly during construction, or as necessary	Habitat is constructed and completed as designed and specified in the construction contract	Resolution with contractor such that the terms of the contract are met

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Area	X	N/A	X
Bird abundance and/or density	X	N/A	X
Density of live and dead oysters	X	N/A	X
Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, and the location of data collection.

Data Review and Clearance

FWRI staff would compile pre-restoration and post-restoration monitoring data in Years 2 and 5, synthesize the results according to monitoring parameters above, and send the data and a draft monitoring report to FWC DWH staff within 2 months of the calendar year ending. FWC DWH staff would quality assure/quality control (QA/QC) the materials and coordinate with FWRI staff should any changes be necessary. After all identified errors are addressed, the monitoring data and report would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review monitoring data and report before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data and report would be stored in the DIVER Restoration Portal. The data and report would be submitted by FWC within 4 months of the calendar year closing.

Data Sharing

The monitoring data and report would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 6 months of the calendar year closing.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

DWH NRDA Trustees. 2017. *Deepwater Horizon* Oil Spill Natural Resource Damage Assessment: Strategic Framework for Sea Turtle Restoration Activities Version 1. June. Available: www.gulfspillrestoration.noaa.gov/2017/06/trustees-release-strategic-frameworks-restoration.

Vitale, N., J. Brush, J. & A. Powell. 2020. Loss of Coastal Islands Along Florida's Big Bend Region: Implications for Breeding American Oystercatchers. Estuaries and Coasts www.doi.org/10.1007/s12237-020-00811-3

B2, Egmont Key Vegetation Management and Dune Retention: Monitoring and Adaptive Management Plan

Prepared by: U.S. Department of the Interior (DOI)

Draft Version Date: 1/7/2021

1 Introduction

This project monitoring and adaptive management (MAM) plan identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the restoration project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degree of uncertainty, this project-specific MAM plan is scaled according to level of uncertainty, scope, scale, and Restoration Type associated with this project.

This MAM plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this document would be made publicly available through the Trustee Council Restoration Portal (www.diver.orr.noaa.gov/web/guest/home) and accessible through the *Deepwater Horizon* Natural Resource Damage Assessment (DWH NRDA) Trustees website (www.gulfspillrestoration.noaa.gov/).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the PDARP/PEIS.

- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type: Birds
- Restoration Approaches: Restore and conserve bird nesting and foraging habitat; Restore and enhance dunes and beaches
- Restoration Techniques: Enhance habitat through vegetation management; Restore dune and beach systems through the use of passive techniques to trap sand
- TIG: Florida Trustee Implementation Group (FL TIG)
- Restoration Plan: Restoration Plan #2

This restoration project is being implemented within Egmont Key National Wildlife Refuge (EKNWR) and Egmont Key State Park. Egmont Key supports approximately 33,000 nesting pairs of birds each year, including brown pelicans (*Pelecanus occidentalis*), black skimmers (*Rynchops niger*), laughing gulls (*Leucophaeus atricilla*), royal terns (*Thalasseus maximus*), sandwich terns (*Thalasseus sandvicensis*), and various wading birds including white ibis (*Eudocimus albus*). The island also contains a variety of vegetated habitats, including sea grape (*Coccoloba uvifera*), mangroves, sea oats (*Uniola paniculata*), and other coastal grasses. This project is a second phase of an ongoing project intended to protect and restore bird nesting habitat on the island by removing invasive vegetation, planting desirable native vegetation, and reducing shoreline erosion. Field activities would occur outside of bird and sea turtle nesting seasons to minimize project-related disturbance to wildlife. Invasive plant control would occur from approximately September through January and desirable native plant restoration would occur in approximately January and February.

Treatment and management of invasive plants has been identified as one of the highest priorities within the National Wildlife Refuge System to restore and protect native habitats. Coin vine (*Dalbergia ecastophyllum*) has invaded bird nesting areas, displacing desirable native plants that were present on the eastern shoreline. Prior to the first phase of the project, coin vine had displaced desirable native vegetation and constituted 40-100 percent cover on approximately 25 acres. The coin vine has formed dense, impenetrable thickets that have shaded out desirable native vegetation and degraded bird nesting and foraging habitat. The first phase of the project used chemical treatment and chipping to remove coin vine from approximately 13 acres and planted sea grape on the treated area. Re-emerging coin vine was re-treated two more times for control and the sea grape has become well-established. Similar to the first phase of the project, this phase would focus on treating and removing coin vine from the remaining approximately 12 acres, planting desirable native vegetation in the treated area, and re-treating re-emerging coin vine as needed. Restoring these areas would increase available bird nesting habitat for species that were impacted by the DWH oil spill.

In addition, this project would protect bird nesting habitat on a portion of the northwest part of the island from erosion by installing sand entrapment materials such as sand fencing and native plants. The western side of the island has eroded significantly in recent decades. During the first phase of this project, over 500 cubic yards of dredged material was deposited on the west side of the island to re-nourish part of the shoreline. Approximately 9 acres of beach habitat was created and then planted with native dune vegetation. However, approximately 5 acres have already been lost to erosion. Sand fencing would protect the remaining habitat from erosion and contribute to dune creation, where native vegetation could be planted if warranted.

The implementing agency is the DOI, in coordination with EKNWR staff and Egmont Key State Park staff.

Restoration Type Goals and Project Restoration Objectives

The overall goals for this Restoration Type relevant to this project, as identified in the PDARP/PEIS, are:

- Restore lost birds by facilitating additional production and/or reduced mortality of injured bird species.
- Restore or protect habitats on which injured birds rely.

The project restoration objectives are:

- Restore potential bird nesting habitat by removing invasive coin vine from approximately 12 acres of dune habitat, and control coin vine on a total of 25 acres of affected area with re-treatment as necessary.
- Plant and maintain desirable native vegetation as potential bird nesting and foraging habitat on 75 percent of the area where plantings occur.
- Protect and enhance dune foraging and nesting habitat by installing sand fencing on the northwest side of the island to reduce erosion and build dune habitat, planting native vegetation where appropriate.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 990.55(b)(1)(vii). Specific, measurable performance

criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

Potential Sources of Uncertainty

Potential uncertainties may affect the likelihood that this project would be successful in fully achieving the goals and objectives in a timely manner. Corrective actions may be necessary to address uncertainties and maximize project benefits. Here we address some uncertainties that were considered during project planning. This list should not be considered exhaustive; additional uncertainties could be identified as the project is implemented and monitored.

Table 1-1 Potential Uncertainties

Uncertainty	Summary of Resolution Strategy
Method to be used for removal of dead coin vine after chemical treatment may be burning, mechanical removal, or chip-in-place	Burning is the preferred method of removal but is often not feasible due to wind conditions and proximity to populated areas. Mechanical removal or chip-in-place would be used in place of burning when needed.
Rate of re-emergence of coin vine in treated area and needed re-treatment interval	In the first phase of the project the treated area of 13 acres was re-treated two additional times within the same year. Expectation is that treated areas would need to be re-treated at least once a year, but could be more frequent based on inspections by EKNWR staff that would occur at twice a year (before and after the growing season). Re-treatment to occur as needed but always before coin vine re-emerges on 25 percent or more of treated area.
Rate of establishment of planted native vegetation	Plantings in first phase of the project established very well, greater than 75 percent. Native plantings may need irrigation or fertilization to assist in establishment. Replacement of dead plants may be required and should consider better suited species depending on site conditions and cause of mortality.
Effectiveness of sand fencing in halting erosion and building dune habitat	Visual inspection of sand fencing area at least twice each year would verify integrity of sand fencing, determine changes in shoreline position, and assess building of dunes. If erosion continues and dunes are not building, modification of technique and placement would be considered. Beach re-nourishment or some type of shoreline hardening may be needed in the future if sand fencing proves to be ineffective.
Breeding birds may not use the restored and enhanced habitat for foraging and nesting right away due to natural variability	The number of breeding birds on the island fluctuates from year to year for reasons unrelated to habitat availability and use of the newly available habitat may lag behind treatment as native vegetation takes time to become established and grow. Bird monitoring that is conducted monthly during the breeding season each year would provide needed information. Areas of restored habitat that are being used can serve as a guide for

Uncertainty	Summary of Resolution Strategy
	future treatments or re-treatments in areas not showing evidence of bird use.
Catastrophic weather (e.g., hurricanes)	May lead to increased erosion and render sand fencing ineffective. May cause delay in the schedule for treatment and removal of invasive vegetation. May cause mortality of planted vegetation.
Human disturbance	EKNWR and the state park are used for recreational purposes and disturbance may occur to nesting or loafing birds. Staff would monitor restoration areas for disturbance and implement disturbance control measures as needed.
Predators	Monitoring of birds would include information related to mammalian and other predators. Predator control actions are ongoing on EKNWR and could be focused on the project area, if necessary.

Conceptual Model, Anticipated Outcomes and Future Activities

The conceptual model, described below, forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities and the desired project outcomes. The proposed restoration activities would provide benefits to birds on Egmont Key by improving nesting and foraging habitat.

Table 1-2 Conceptual Model

Activity	Output	Short-term outcome	Long-term outcome
Treatment and removal of invasive coin vine	Area cleared of coin vine	Additional area available to be restored to native condition	Increased nesting and foraging habitat for injured bird species
Planting of native vegetation	Increased area with native vegetation	Establishment of native vegetation and restoration to native condition	Increased nesting and foraging habitat for injured bird species
Installation of sand fencing	Sand fencing installed	Halting of erosion and rebuilding of dune habitat	Increased dune habitat available for nesting and foraging

2 Adaptive Management

As noted above, there is some uncertainty related to the short-term effectiveness of project activities as well as the likelihood that the restored habitat is used and leads to additional production of injured bird species. To adaptively manage this project, and increase the likelihood of achieving the project objective, DOI project personnel would conduct targeted monitoring and use the monitoring data to refine future management actions. For example, evaluations of the area and percent cover of the invasive plants over time would be compared to pre-project conditions and used to refine future management actions. In addition, this plan details below data to be collected on bird nesting and use of

the restored habitat that would contribute to adaptive management regarding selection, design, and implementation of future restoration projects.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

Performance monitoring is designed to determine if projects are meeting overall restoration objectives. Performance monitoring would also assist in determining the need for corrective actions and adaptive management. The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed.

Information on each monitoring parameter is provided below, organized by objective. The list of corrective actions provided below is not exhaustive; rather, it includes a list of potential actions to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Restore potential bird nesting habitat by removing invasive coin vine from approximately 12 acres of dune habitat, and control coin vine on a total of 25 acres of affected area with re-treatment as necessary.

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Area and proportional coverage of invasive vegetation	Monitor progress toward objective	Aerial imagery or ground-based GPS with GIS methods to define area cleared as proportion of total project area	2 times per year (beginning and end of growing season); 1 year prior to treatment and each year until end of project period	Combined across entire project area	Area of invasive vegetation is reduced by 12 acres and 25 acres is maintained in restored condition	Re-treatment of invasive vegetation as needed but always before coverage reaches 25 percent within the treated area; Re-evaluate treatment methods
Breeding bird nest counts and area occupied	Determine usage of newly available nesting habitat	Pre- and post-restoration shorebird abundance and/or density (all age classes) using data from the Florida Shorebird Database, a central repository for data collected on shorebirds and seabirds in Florida using The Breeding Bird Protocol for Florida's Shorebirds and Seabirds.	Monthly throughout breeding season every year, per Florida Shorebird Alliance Protocols	Separate bird count data collected for treated area (in aggregate) and remainder of island; record area occupied by nesting birds in each portion	Usage of restored habitat by breeding birds	Areas of restored habitat that are being used can serve as a guide for future treatments or re-treatments in areas not showing evidence of bird use
Fledgling counts	Determine production of injured bird species in newly available nesting habitat	Pre- and post-restoration shorebird fledgling counts using data from the Florida Shorebird Database, a central repository for data collected on	Monthly throughout breeding season every year, per Florida Shorebird Alliance protocols	Separate data collected for treated area (aggregate) and remainder of island	Production of fledglings from nests in restored habitat	Determine cause of nest failure (predators, disturbance) and plan to address; Compare to other similar sites as baseline

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
		shorebirds and seabirds in Florida using The Breeding Bird Protocol for Florida's Shorebirds and Seabirds.				

Objective 2: Plant and maintain desirable native vegetation as potential bird nesting and foraging habitat on 75 percent of the area where plantings occur.

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Area and proportional coverage of native vegetation	Monitor progress toward objective	Aerial imagery or ground-based GPS with GIS methods to define area as proportion of total project area	Twice per year (beginning and end of growing season); one year prior to treatment and each year until end of project period	Combined across entire project area	Area of native vegetation increased over term of the project	Determine whether plantings need irrigation or fertilization to assist in establishment; Replacement of dead plants may be required and should consider better suited species depending on site conditions and cause of mortality
Native plant percent survival	Evaluate successful establishment; inform future plantings	Ground-based quadrat sampling	Twice per year (beginning and end of growing season) beginning after planting and each year until end of project period	Ten random sites	Percent of native plantings surviving is sufficient to increase native plant cover as above	Determine whether plantings need irrigation or fertilization to assist in establishment; Replacement of dead plants may be required and should consider better suited species depending on site conditions and cause of mortality

Objective 3: Protect and enhance dune foraging and nesting habitat by installing sand fencing or an alternative sand trapping material along the beach on the northwest side of the island to reduce erosion and build dune habitat, planting native vegetation where appropriate.

Performance Monitoring Parameter	Purpose	Method	Timing, Frequency, Duration	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Length of sand fencing installed	Monitor progress toward objective	Measurement of installed combined length of fencing; recording of end points of fencing to mark position	One-time report at completion of installation; Monitoring reports 2 times per year each year thereafter until end of project period	N/A	500 linear feet of sand fencing installed	Erosion may require movement of sand fencing; Potential repairs as needed
Shoreline position	Monitor effectiveness in reducing erosion of shoreline	Stakes at intervals above and below current shoreline position	2 times per year; 1 year prior to sand trapping material installation and each year until end of project period	At least 2 sets of stakes, one at each end of treated area	Shoreline erosion stops	Erosion may require movement of sand fencing; Potential repairs as needed or additional sand fencing or alternative material
Dune elevation	Monitor effectiveness in building dune habitat	Stakes at intervals behind sand fencing or throughout treated area (can be some of the same used in shoreline position)	2 times per year; 1 year prior to sand trapping material installation and each year until end of project period	4 stakes, a set of two at each end of treated area	Dune elevation increases in treated area	Erosion may require movement of sand fencing; Potential repairs as needed or additional sand fencing or alternative material

4 Monitoring Schedule

The schedule for project performance monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameters	Pre-execution; execution Year 1	As-built Year 2	Post-execution monitoring Year 3	Post-execution monitoring Year 4	Post-execution monitoring Year 5
Nature, number, extent, duration, timing of treatment actions	X	X	X	X	X
Area and proportional coverage of invasive vegetation	X	X	X	X	X
Breeding bird nest counts and area occupied	X	X	X	X	X
Fledgling counts	X	X	X	X	X
Nature, number, extent, duration, timing of planting activities	X	X	X	X	X
Area and proportional coverage of native vegetation	X	X	X	X	X
Native plant percent survival		X	X	X	X
Length and area of sand fencing installed		X			
Shoreline position	X	X	X	X	X
Dune elevation	X	X	X	X	X

5 Evaluation

The FL TIG anticipates conducting an evaluation of the monitoring data collected (as described above) to help answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration 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?

6 Data Management

Data Description

Data collection would be compiled within 12 months after collection. To the extent practicable, all environmental and biological data generated during monitoring activities would be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then project-specific datasheets would be drafted prior to conducting any

project monitoring activities. Original hardcopy datasheets and notebooks and photographs would be retained by DOI.

Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format as per protocols. All field datasheets and notebook entries would be scanned to PDF files. Electronic data files should be named with the date on which the file was created and should 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 should be made and the original preserved.

All data would have properly documented Federal Geographic Data Committee/International Organization for Standardization (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, quality assurance/quality control [QA/QC] procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents).

Data Review and Clearance

Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format. After transcription of the data, the electronic data sheets would be verified 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 would verify and validate MAM data and information and would ensure that all data are: i) entered or converted into agreed upon/commonly used digital format; ii) labeled with metadata following FGDC/ISO standards to the extent practicable and in accordance with DOI requirements.

After all identified errors are addressed, data are considered to be QA/QC'ed. DOI would give the other TIG members time to review the data before making such information publicly available (as described below). Before submitting the monitoring data and information package, co-Implementing Trustees shall confirm with one another that the package is approved for submission.

Data Storage and Accessibility

Once all data has been QA/QC'ed it would be submitted to the Restoration Portal. Trustees would provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than 1 year from when data are collected.

Data Sharing

Data would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Explorer Interface within 1 year of when the data collection occurred.

7 Reporting

All reporting would occur after field surveys are completed annually. This report would summarize the findings for the sampling period including all worksheets transferred into digital format and presented in tabular and graphical formats. The data should be summarized in such a way that it is meaningful to the reader. Additionally, an annual report would be completed that includes:

- Summary data –synthesized data for all efforts during the year.
- Graphics, if applicable, and associated interpretations of the data.
- Comparisons of pre- and post-project conditions, as applicable.
- Any uncertainties with management actions.
- Potential data collection issues.
- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Data would be reviewed and submitted to the Restoration Portal by DOI U.S. Fish and Wildlife Service project personnel.

B3, Northeast Florida Coastal Predation Management: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS; *Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees, 2016a) and the Strategic Framework for Bird Restoration Activities (DWH NRDA Trustees, 2017), and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (SOP Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the PDARP/PEIS.

- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type: Birds
- Restoration Approach: Restore and conserve bird nesting and foraging habitat (PDARP/PEIS Section 5.5.12.2; DWH NRDA Trustees, 2016a)
- Restoration Technique: Nesting and foraging area stewardship (PDARP/PEIS Appendix 5.D.6.1, Strategic Framework for Bird Restoration Activities; Module 4, Section 2.1)

This restoration project is being implemented within Nassau, Duval, and St. Johns Counties in Northeast Florida. This project includes restoration actions to improve nesting success and population size of bird species (specifically, American oystercatchers [*Haematopus palliatus*], least terns [*Sternula antillarum*], black skimmers [*Rynchops niger*], and Wilson's plovers [*Charadrius wilsonia*]) in Northeast Florida by 1) monitoring nest success and predation rates, 2) conducting predator tracking, 3) implementing non-lethal and lethal predator-control measures, and 4) conducting education and outreach on the importance of predation management. This project would directly benefit bird populations that are known to suffer from high levels of predation from artificially inflated predator populations.

The implementing agency is FWC. Project partners include Florida Department of Environmental Protection-Florida Park Service (FDEP-FPS), Guana Tolomato Matanzas National Estuarine Research

Reserve, Northeast Florida aquatic preserves, St. Johns County, City of Jacksonville, and the National Park Service (NPS; Fort Matanzas National Monument).

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goals relevant to this project, as identified in the PDARP/PEIS, are:

- Restore lost birds by facilitating additional production and/or reduced mortality of injured bird species.
- Restore or protect habitats on which injured birds rely.

The restoration objective for this project is:

- Implement predation management measures at critical nesting sites to increase breeding success for American oystercatchers, least terns, black skimmers, and Wilson's plovers.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Implement predation management measures at critical nesting sites to increase breeding success for American oystercatchers, least terns, black skimmers, and Wilson's plovers.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Area (acres)	Monitor progress toward meeting restoration objective	Florida Fish and Wildlife Research Institute (FWRI) staff would determine the number of acres protected, conserved, or restored as a result of project activities	Annually compiled during project implementation following initiation of relevant project activities	At locations where predation management measures have been implemented (number and specific location to be determined)	An increase in acreage of habitat protected, conserved, or restored	N/A
Core: Bird abundance and/or density (count)	Monitor progress toward meeting restoration objective	FWRI staff would determine bird abundance and/or density of focal species (all age classes) using data from the Florida Shorebird Database that was collected using The Breeding Bird Protocol for Florida's Shorebirds and Seabirds. Data would include presence/ absence or abundance, number of nesting pairs, reproductive success (e.g., number of nests, number of fledglings, etc.), survival (adults, juveniles, and/or chicks), number of nests protected, number of sites with targeted predation management, and/or nest location/ habitat preference(s) of nesting pairs	Annually collected during project implementation according to The Breeding Bird Protocol for Florida's Shorebirds and Seabirds	At locations where predation management measures have been implemented in the project area (number and specific location to be determined)	An increase in abundance and/or density	N/A
Objective-specific: Nature, number, extent, duration, and timing of	Monitor progress toward meeting	FWRI staff would determine nature, number, extent, duration, and timing of management actions	Annually compiled during project implementation following initiation	At locations where predation management measures have been implemented in the	An increase in predation management measures in the project area	N/A

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
management actions (multiple)	restoration objective		of relevant project activities	project area (number and specific location to be determined)		

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Area	N/A	X	N/A
Bird abundance and/or density	N/A	X	N/A
Nature, number, extent, duration, and timing of management actions	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWRI staff would collect monitoring data throughout the calendar year, quality assure/quality control (QA/QC) the data according to Florida Shorebird Database (FSD) standards, compile the results and input them into FSD, and send a draft annual monitoring report (with reference on how to access the raw data associated with bird abundance and/or density in the FSD) to FWC DWH staff annually in June/July for the data collected in the prior calendar year. FWC DWH staff would QA/QC the annual monitoring report and coordinate with FWRI staff should any changes be necessary. After all identified errors are addressed, the report would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review the annual monitoring report before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data associated with bird abundance and/or density would be stored in the FSD. The QA/QC'ed annual monitoring report, which would reference how to access the raw bird data in the FSD, would be added to the DIVER Restoration Portal by FWC DWH staff within 8 months of the calendar year ending.

Data Sharing

The monitoring data associated with bird abundance and/or density would be made publicly available in the FSD within 1 year of the FSD closing each year (generally October). The annual monitoring report would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 10 months of the calendar year ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

DWH NRDA Trustees. 2017. *Deepwater Horizon* Oil Spill Natural Resource Damage Assessment: Strategic Framework for Sea Turtle Restoration Activities Version 1. June. Available: www.gulfspillrestoration.noaa.gov/2017/06/trustees-release-strategic-frameworks-restoration.

B4, Florida Shorebird and Seabird Stewardship and Habitat Management - 5 Years: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS; *Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees, 2016a) and the Strategic Framework for Bird Restoration Activities (DWH NRDA Trustees, 2017), and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (Standard Operating Procedures Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the PDARP/PEIS.

- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type: Birds
- Restoration Approach: Restore and conserve bird nesting and foraging habitat (PDARP/PEIS Section 5.5.12.2; DWH NRDA Trustees, 2016a)
- Restoration Technique: Nesting and foraging area stewardship (PDARP/PEIS Appendix 5.D.6.1, Strategic Framework for Bird Restoration Activities; Module 4, Section 2.1)

This restoration project is being implemented along the Florida Gulf Coast (Escambia-Monroe Counties) and select sites in Northeast Florida (Nassau, Duval, and St. Johns Counties). This project includes restoration actions to enhance bird (specifically, black skimmer [*Rynchops niger*], least tern [*Sternula antillarum*], American oystercatcher [*Haematopus palliatus*], Wilson's plover [*Charadrius wilsonia*], and snowy plover [*Charadrius nivosus*]) production by implementing four strategies: 1) reducing human disturbance at bird nesting sites, 2) improving habitat quality, 3) reducing predation at bird nesting sites, and 4) improving regulatory coordination. This project includes measures such as placing symbolic fencing around bird nesting areas, improving enforcement of existing laws and regulations, habitat enhancement projects, targeted predator management, and improving permitting guidelines for beach-nesting birds. This project would directly improve bird nesting success by mitigating known sources of disturbance and mortality.

The implementing agency is FWC, in coordination with Audubon Florida.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goals relevant to this project, as identified in the PDARP/PEIS, are:

- Restore lost birds by facilitating additional production and/or reduced mortality of injured bird species.
- Restore or protect habitats on which injured birds rely.

The restoration objective for this project is:

- Restore and protect shorebird and seabird species by employing four strategies (reduce human disturbance, improve habitat quality, reduce predation, and improve regulatory coordination) to increase populations of black skimmers, least terns, American oystercatchers, Wilson's plovers, and snowy plovers.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Restore and protect shorebird and seabird species by employing four strategies (reduce human disturbance, improve habitat quality, reduce predation, and improve regulatory coordination) to increase populations of black skimmers, least terns, American oystercatchers, Wilson's plovers, and snowy plovers.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Bird abundance and/or density (count)	Monitor progress toward meeting restoration objective	Florida Fish and Wildlife Research Institute (FWRI) staff would determine bird abundance and/or density of focal species (all age classes) using data from the FSD that was collected using The Breeding Bird Protocol for Florida's Shorebirds and Seabirds. Data would include presence/absence or abundance, number of nesting pairs, reproductive success (e.g., number of nests, number of fledglings), survival (adults, juveniles, and/or chicks), number of nests protected, number of sites with targeted predation management, and/or nest location/ habitat preference(s) of nesting pairs	Annually collected during project implementation according to the Breeding Bird Protocol for Florida's Shorebirds and Seabirds	At locations where project activities have been implemented in the project area (number and specific location to be determined [TBD])	An increase in abundance and/or density in the project area	N/A
Objective-specific: Nature, number, extent, duration, and timing of management actions (multiple)	Monitor progress toward meeting restoration objective	FWRI staff would determine nature, number, extent, duration, and timing of management actions	Annually compiled during project implementation following initiation of relevant project activities	At locations where project activities have been implemented in the project area (number and specific location TBD)	An increase in management and stewardship actions in the project area	N/A

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Bird abundance and/or density	N/A	X	N/A
Nature, number, extent, duration, and timing of management actions	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWRI staff would collect breeding shorebird and seabird data throughout the calendar year, quality assure/quality control (QA/QC) the data according to Florida Shorebird Database (FSD) standards, compile the results and input them into FSD, and send a draft annual monitoring report (with reference on how to access the raw data associated with bird abundance and/or density in the FSD) to FWC DWH staff annually in June/July for the data collected in the prior calendar year. FWC DWH staff would QA/QC the monitoring report and coordinate with FWRI staff should any changes be necessary. After all identified errors are addressed, the report would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review the annual monitoring report before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data associated with bird abundance and/or density would be stored in the FSD. The QA/QC'ed annual monitoring report, which would reference how to access the raw bird data in the FSD, would be added to the DIVER Restoration Portal by FWC DWH staff within 8 months of the calendar year ending.

Data Sharing

The monitoring data associated with bird abundance and/or density would be made publicly available in the FSD within 1 year of the FSD closing each year (generally October). The annual monitoring report would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 10 months of the calendar year ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

DWH NRDA Trustees. 2017. *Deepwater Horizon* Oil Spill Natural Resource Damage Assessment: Strategic Framework for Sea Turtle Restoration Activities Version 1. June. Available: www.gulfspillrestoration.noaa.gov/2017/06/trustees-release-strategic-frameworks-restoration.

REC1, Pensacola Community Maritime Park Public Fishing Marina: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the MAM Manual Version 1.0 (*Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees 2019) and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (Standard Operating Procedures Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS).

- Programmatic Goal: Provide and Enhance Recreational Opportunities
- Restoration Type: Provide and Enhance Recreational Opportunities
- Restoration Approach: Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2; DWH NRDA Trustees, 2016a)
- Restoration Technique (MAM Manual E.11.1):
    - Enhance or construct infrastructure (e.g., boat ramps, piers, boardwalks, dune crossovers, camp sites, educational/interpretive spaces, navigational channel improvements and dredging, safe harbors, navigational aids, ferry services, rebuilding of previously damaged or destroyed facilities, promenades, trails, roads and bridges to access natural resources, and marina pump out stations).

This project would be implemented at Community Maritime Park in Pensacola, Florida. This project includes restoration actions to provide and enhance recreational opportunities in Pensacola by constructing a 48-slip fishing marina. This project is intended to enhance public access by providing a public day-use marina in a location with no public marinas, providing a location to host public and charity fishing tournaments.

The implementing agency is FWC in coordination with the City of Pensacola.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goal relevant to this project, as identified in the PDARP/PEIS, is:

- 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 restoration objective for this project is:

- Provide and enhance recreational access at Community Maritime Park by enhancing/increasing fishing opportunities through the construction of a new public fishing marina and associated educational components.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Provide and enhance recreational access at Community Maritime Park by enhancing/increasing fishing opportunities through the construction of a new public fishing marina and associated educational components.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Visitor Use/Access (count)	Monitor progress toward meeting restoration objective	Direct observations by FWC Boating and Waterways staff on-site using a Site Visitation Form. Staff would record number of vehicles and estimated number of visitors	For 2 years post-construction, monitor twice a year for at least 3 hours during peak time periods: once during Period 1 (May-Jun) and once during Period 2 (Aug-Sept)	4: twice per year for 2 years at the marina	Members of the public are able to use the constructed amenities	N/A
Objective specific: Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	Monitor progress toward meeting restoration objective	Review of contractor reports, on-site inspections, and comparison of construction to "as-built" drawings or other planning materials	Approximately monthly during construction and at the end of construction warranty period, unless otherwise provided by contract	At locations of constructed amenities; approximately monthly during construction, or as necessary	Amenities are constructed and completed as designed and specified in the construction contract	Resolution with contractor such that the terms of the contract are met

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Visitor Use/Access	N/A	N/A	X
Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWC Boating and Waterways staff would record data on a hardcopy Site Visitation Form which they would review and sign prior to scanning/emailing a PDF version to FWC DWH staff within 2 months of data collection. FWC DWH staff would quality assure/quality control (QA/QC) the document and coordinate with FWC Boating and Waterways staff should any changes be necessary. After all identified errors are addressed, the monitoring data would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review the monitoring data before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data would be stored in the DIVER Restoration Portal. Data would be submitted by FWC within 4 months of the calendar year ending.

Data Sharing

The monitoring data would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 6 months of the calendar year ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

REC2, Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the MAM Manual Version 1.0 (*Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees 2019) and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (Standard Operating Procedures Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS).

- Programmatic Goal: Provide and Enhance Recreational Opportunities
- Restoration Type: Provide and Enhance Recreational Opportunities
- Restoration Approach: Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2; DWH NRDA Trustees, 2016a)
- Restoration Technique (MAM Manual E.11.1):
    - Enhance or construct infrastructure (e.g., boat ramps, piers, boardwalks, dune crossovers, camp sites, educational/interpretive spaces, navigational channel improvements and dredging, safe harbors, navigational aids, ferry services, rebuilding of previously damaged or destroyed facilities, promenades, trails, roads and bridges to access natural resources, and marina pump out stations).

This restoration project would be implemented at Baars Park and Sanders Beach in Pensacola, Florida. This project would include construction of recreational infrastructure at Baars Park (including a pier, dock, parking lot, and informational signage) and enhancement of existing recreational infrastructure at Sanders Beach (including converting the powercraft launch to a kayak launch, expanding the parking lot, and installing information signage). This project is intended to provide recreational access to waterways at a site that currently does not provide access (Baars Park) and enhance recreational activities such as kayaking and fishing.

The implementing agency is FWC in coordination with the City of Pensacola.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goal relevant to this project, as identified in the PDARP/PEIS, is:

- 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 restoration objective for this project is:

- Provide and enhance recreational access at Baars Park and Sanders Beach by enhancing/increasing fishing opportunities through the construction of new or enhancement of existing amenities.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Provide and enhance recreational access at Baars Park and Sanders Beach by enhancing/increasing fishing opportunities through the construction of new or enhancement of existing amenities.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Visitor Use/Access (count)	Monitor progress toward meeting restoration objective	Direct observations by FWC Boating and Waterways staff on-site using a Site Visitation Form. Staff would record number of vehicles and estimated number of visitors	For 2 years post-construction, monitor twice a year for at least 3 hours during peak time periods: once during Period 1 (May-Jun) and once during Period 2 (Aug-Sept)	8: twice per year for 2 years at two locations: 1. Baars Park and 2. Sanders Beach	Members of the public are able to use the constructed amenities	N/A
Objective specific: Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	Monitor progress toward meeting restoration objective	Review of contractor reports, on-site inspections, and comparison of construction to "as-built" drawings or other planning materials	Approximately monthly during construction and at the end of construction warranty period, unless otherwise provided by contract	At locations of constructed amenities; approximately monthly during construction, or as necessary	Amenities are constructed and completed as designed and specified in the construction contract	Resolution with contractor such that the terms of the contract are met

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Visitor Use/Access	N/A	N/A	X
Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWC Boating and Waterways staff would record data on a hardcopy Site Visitation Form which they would review and sign prior to scanning/emailing a PDF version to FWC DWH staff within 2 months of data collection. FWC DWH staff would quality assure/quality control (QA/QC) the document and coordinate with FWC Boating and Waterways staff should any changes be necessary. After all identified errors are addressed, the monitoring data would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review the monitoring data before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data would be stored in the DIVER Restoration Portal. Data would be submitted by FWC within 4 months of the calendar year ending.

Data Sharing

The monitoring data would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 6 months of the calendar ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

REC4, Gulf Breeze Parks Boating and Fishing Access Upgrades: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the MAM Manual Version 1.0 (*Deepwater Horizon* Natural Resource Damage Assessment [DWH Trustees] 2019) and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (Standard Operating Procedures Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS).

- Programmatic Goal: Provide and Enhance Recreational Opportunities
- Restoration Type: Provide and Enhance Recreational Opportunities
- Restoration Approach: Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2; DWH NRDA Trustees, 2016a)
- Restoration Technique (MAM Manual E.11.1):
    - Enhance or construct infrastructure (e.g., boat ramps, piers, boardwalks, dune crossovers, camp sites, educational/interpretive spaces, navigational channel improvements and dredging, safe harbors, navigational aids, ferry services, rebuilding of previously damaged or destroyed facilities, promenades, trails, roads and bridges to access natural resources, and marina pump out stations).

This restoration project would be implemented at Woodland Park, Shoreline Park South, and Vista Park in Gulf Breeze, Florida. This project would enhance recreational infrastructure at three existing parks by 1) constructing a pier, dock, kayak launch, restroom, and parking lot at Woodland Park, 2) demolishing the existing fishing pier and constructing an expanded fishing pier, renovating the existing boat launches, constructing an additional boat launch, and enhancing parking at Shoreline Park South, and 3) constructing a boat launch and floating dock at Vista Park. This project is intended to enhance recreational activities such as boating, kayaking, and fishing.

The implementing agency is FWC in coordination with the City of Gulf Breeze.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goal relevant to this project, as identified in the PDARP/PEIS, is:

- 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 restoration objective for this project is:

- Provide and enhance recreational access at Shoreline Park South, Woodlands Park, and Vista Park by enhancing/increasing fishing opportunities through the construction of new or enhancement of existing amenities.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Provide and enhance recreational access at Shoreline Park South, Woodlands Park, and Vista Park by enhancing/increasing fishing opportunities through the construction of new or enhancement of existing amenities.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Visitor Use/Access (count)	Monitor progress toward meeting restoration objective	Direct observations by FWC Boating and Waterways staff on-site using a Site Visitation Form. Staff would record number of vehicles and estimated number of visitors	For 2 years post-construction, monitor twice a year for at least 3 hours during peak time periods: once during Period 1 (May-Jun) and once during Period 2 (Aug-Sept)	12: twice per year for 2 years at three park locations: 1. Shoreline Park South, 2. Woodlands Park, and 3. Vista Park	Members of the public are able to use the constructed amenities	N/A
Objective specific: Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	Monitor progress toward meeting restoration objective	Review of contractor reports, on-site inspections, and comparison of construction to "as-built" drawings or other planning materials	Approximately monthly during construction and at the end of construction warranty period, unless otherwise provided by contract	At locations of constructed amenities; approximately monthly during construction, or as necessary	Amenities are constructed and completed as designed and specified in the construction contract	Resolution with contractor such that the terms of the contract are met

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Visitor Use/Access	N/A	N/A	X
Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWC Boating and Waterways staff would record data on a hardcopy Site Visitation Form which they would review and sign prior to scanning/emailing a PDF version to FWC DWH staff within 2 months of data collection. FWC DWH staff would quality assure/quality control (QA/QC) the document and coordinate with FWC Boating and Waterways staff should any changes be necessary. After all identified errors are addressed, the monitoring data would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review the monitoring data before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data would be stored in the DIVER Restoration Portal. Data would be submitted by FWC within 4 months of the calendar year ending.

Data Sharing

The monitoring data would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 6 months of the calendar year ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

REC5, Lincoln Park Boat Ramp and Dock Improvements: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the MAM Manual Version 1.0 (*Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees 2019) and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (Standard Operating Procedures Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS).

- Programmatic Goal: Provide and Enhance Recreational Opportunities
- Restoration Type: Provide and Enhance Recreational Opportunities
- Restoration Approach: Enhance public access to natural resources for recreational use (PDARP/PEIS Section 5.5.14.2; DWH NRDA Trustees, 2016a)
- Restoration Technique (MAM Manual E.11.1):
    - Enhance or construct infrastructure (e.g., boat ramps, piers, boardwalks, dune crossovers, camp sites, educational/interpretive spaces, navigational channel improvements and dredging, safe harbors, navigational aids, ferry services, rebuilding of previously damaged or destroyed facilities, promenades, trails, roads and bridges to access natural resources, and marina pump out stations).

This restoration project would be implemented at Lincoln Park in Valparaiso, Florida. This project would rehabilitate existing recreational infrastructure at the park, including replacing the existing single-lane boat ramps with one double-lane ramp, replacing the central pier with two flanking access docks, and repairing and expanding the parking lot. This project is intended to enhance recreational activities such as boating and fishing.

The implementing agency is FWC in coordination with the City of Valparaiso.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goal relevant to this project, as identified in the PDARP/PEIS, is:

- 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 restoration objective for this project is:

- Provide and enhance recreational access at Lincoln Park by enhancing/increasing fishing opportunities through the construction of new or enhancement of existing amenities.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Provide and enhance recreational access at Lincoln Park by enhancing/increasing fishing opportunities through the construction of new or enhancement of existing amenities.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Visitor Use/Access (count)	Monitor progress toward meeting restoration objective	Direct observations by FWC Boating and Waterways staff on-site using a Site Visitation Form. Staff would record number of vehicles and estimated number of visitors.	For 2 years post-construction, monitor twice a year for at least 3 hours during peak time periods: once during Period 1 (May-Jun) and once during Period 2 (Aug-Sept)	4: twice per year for 2 years at Lincoln Park	Members of the public are able to use the constructed amenities	N/A
Objective specific: Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	Monitor progress toward meeting restoration objective	Review of contractor reports, on-site inspections, and comparison of construction to "as-built" drawings or other planning materials	Approximately monthly during construction and at the end of construction warranty period, unless otherwise provided by contract	At locations of constructed amenities; approximately monthly during construction, or as necessary	Amenities are constructed and completed as designed and specified in the construction contract	Resolution with contractor such that the terms of the contract are met

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Visitor Use/Access	N/A	N/A	X
Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWC Boating and Waterways staff would record data on a hardcopy Site Visitation Form which they would review and sign prior to scanning/emailing a PDF version to FWC DWH staff within 2 months of data collection. FWC DWH staff would quality assure/quality control (QA/QC) the document and coordinate with FWC Boating and Waterways staff should any changes be necessary. After all identified errors are addressed, the monitoring data would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review the monitoring data before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data would be stored in the DIVER Restoration Portal. Data would be submitted by FWC within 4 months of the calendar year ending.

Data Sharing

The monitoring data would be made publicly available, in accordance with the Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 6 months of the calendar year ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

REC8, Florida Artificial Reef Creation and Restoration - Phase 2: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the MAM Manual Version 1.0 (*Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees 2019) and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (Standard Operating Procedures Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS).

- Programmatic Goal: Provide and Enhance Recreational Opportunities
- Restoration Type: Provide and Enhance Recreational Opportunities
- Restoration Approach: Enhance recreational experiences (PDARP/PEIS Section 5.5.14.2; DWH NRDA Trustees, 2016a)
- Restoration Technique: Place stone, concrete, or permissible materials to create artificial reef structures (PDARP/PEIS Appendix 5.D.8.2; MAM Manual E.12.1)

This restoration project would be implemented within federal and state waters adjacent to Escambia, Santa Rosa, Okaloosa, Walton, Bay, Gulf, Franklin and Wakulla Counties in Florida. This project would enhance artificial reef sites at various locations in Florida Gulf Coast nearshore waters by constructing artificial reefs with a variety of materials (rock boulders, prefabricated concrete, design modules). This project is intended to enhance recreational fishing activities.

The implementing agency is FWC in coordination with Escambia, Santa Rosa, Okaloosa, Walton, Bay, Gulf, Franklin, and Wakulla Counties and the City of Mexico Beach.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goal relevant to this project, as identified in the PDARP/PEIS, is:

- 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 restoration objective for this project is:

- Provide and enhance recreational fishing, snorkeling, and scuba-diving opportunities and experiences through artificial reef development across Northwest Florida.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Provide and enhance recreational fishing, snorkeling, and scuba-diving opportunities and experiences through artificial reef development across Northwest Florida.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Core: Visitor use/access (count)	Monitor progress toward meeting	Direct (boat-based[67], aerial[68], or	For 2 years post-construction, monitor twice a year for at least 3	12+: twice per year for 2 years at a	Members of the public are able to use the	N/A

[67] Boat-based observations of boating activity can be an effective means to document the number of boats and the type of activity (fishing or diving) using specific reef locations.

[68] Aerial observations from fixed-wing aircraft can be an effective way to quickly measure human use, as all reef sites could be visited in a single flight. Techniques similar to those developed by Stouter (1997) and used by the National Oceanic and Atmospheric Administration to measure changes in no-take areas use over time may be implemented.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
	restoration objective	shore-based[69] counts) and indirect (passive acoustic listening[70]) observations by FWC Artificial Reef Program staff to record number of visitors to reefs (e.g., recreational anglers, SCUBA divers, and snorkelers)	hours ideally targeting the start of fishing season for target species (e.g., red snapper [*Lutjanus campechanus*], triggerfish, amberjack [*Seriola sp.*], cobia [*Rachyentron canadum*])	minimum of three sites	constructed reefs	
Objective specific: Infrastructure or habitat constructed and/or enhanced and completed as designed	Monitor progress toward meeting restoration objective	Review of contractor reports, on-site inspections, and comparison of construction to "as-built" drawings or other planning materials	Approximately monthly during construction and at the end of construction warranty period, unless otherwise provided by contract	At locations of constructed reefs; approximately monthly during construction, or as necessary	Reefs are constructed and completed as designed and specified in the construction contract	Resolution with contractor such that the terms of the contract are met

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

[69] Shore-based observations of boating and snorkeling activity is a technique used to count boats at reef sites, such as snorkeling reefs, within binocular view of the shoreline. Staff would use stratified random surveys to visit the beach adjacent to a reef site and count boats using binoculars or high-powered spotting scopes.

[70] Passive acoustic listening devices (i.e., dataloggers) can be used to quantify boating activity of offshore reefs by differentiating vessel engine sounds as they approach, depart and stop at reefs. The noise created by vessels is typically low frequency (e.g., 20 hertz – 10 kilohertz), where attenuation is particularly low. Therefore, passive acoustic monitoring of vessels is particularly effective and can operate at spatial scales of several kilometers. Dataloggers would be deployed at discrete locations to provide continuous boating usage data on constructed reefs. The data would be processed by a qualified FWC employee and analyzed similar to the methods described by Simard et al. 2016. Additional field time would be required to deploy, maintain and retrieve the dataloggers throughout the project.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Visitor use/access	N/A	N/A	X
Infrastructure or habitat constructed and/or enhanced and completed as designed	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above and associated footnotes for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWC Artificial Reef Program staff would collect monitoring data throughout the calendar year, compile the results, and send a draft annual monitoring report to FWC DWH staff within 2 months of the calendar year ending. FWC DWH staff would quality assure/quality control (QA/QC) the monitoring report and coordinate with project staff should any changes be necessary. After all identified errors are addressed, the monitoring report would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review monitoring report before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed annual monitoring report would be stored in the DIVER Restoration Portal. The report would be submitted by FWC within 4 months of the calendar year ending.

Data Sharing

The annual monitoring report would be made publicly available, in accordance with Open, Public, Electronic and Necessary Government Data Act of 2019, through the DIVER Restoration Portal within 6 months of the calendar year ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

Schmitt, E. F. and K. M. Sullivan. 1996. Analysis of a volunteer method for collecting fish presence and abundance data in the Florida Keys. Bulletin of Marine Science 59(2): 404-416.

Simard, P., K.R. Wall, D.A. Mann, C.C. Wall and C.D. Stallings. 2016. Quantification of boat visitation rates at artificial and natural reefs in the eastern Gulf of Mexico using acoustic recorders. PloS one, 11(8):p.e0160695.

Stouter, R. A. 1997. Review of Florida Marine Research Institute (FMRI) aerial fly-over methods for estimating the number and type of uses in the specially protected areas and ecological reserves of the Florida Keys National Marine Sanctuary: report submitted under contract 40AANC704233 to the National Oceanic and Atmospheric Administration, National Ocean Service, Strategic Environmental Assessment Division, Silver Spring. 14 p.

REC9, Apollo Beach Recreational Sportfish Hatchery Facility: Monitoring and Adaptive Management Plan

Prepared by: Florida Fish and Wildlife Conservation Commission (FWC)

Draft Version Date: 1/7/2021

1 Introduction

This monitoring and adaptive management (MAM) plan follows guidance provided in the MAM Manual Version 1.0 (*Deepwater Horizon* Natural Resource Damage Assessment [DWH NRDA] Trustees 2019) and identifies the monitoring needed to evaluate progress toward meeting project objectives and to support any necessary adaptive management of the project. Where applicable, it identifies key sources of uncertainty and incorporates monitoring data and decision points that address these uncertainties. As not all projects would have the same sources and degrees of uncertainty, this project-specific MAM plan is scaled according to the level of uncertainty, scope, scale, and Restoration Type associated with this project.

This plan is a living document and may be updated as needed to reflect changing conditions and/or new information. Any future revisions to this MAM plan would be uploaded to the Data Integration Visualization Exploration and Reporting (DIVER) Restoration Portal (Standard Operating Procedures Section 10.7.1; DWH NRDA Trustees, 2016b).

Project Overview

This project is being implemented as restoration for the DWH oil spill NRDA, consistent with the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS).

- Programmatic Goal: Provide and Enhance Recreational Opportunities
- Restoration Type: Provide and Enhance Recreational Opportunities
- Restoration Approach: Enhance recreational experiences (PDARP/PEIS Section 5.5.14.2; DWH NRDA Trustees, 2016a)
- Restoration Technique (MAM Manual E.12.1):
    - Enhance recreational fishing opportunities through aquaculture.

This project would be implemented in Apollo Beach, Florida. This project would enhance sportfish aquaculture along the Florida Gulf Coast by constructing a fish production facility (including office space). This project is intended to enhance recreational fishing opportunities through the production and release of marine sportfish, specifically red drum (*Scieanops ocellatus*) and spotted seatrout (*Cynoscion nebulosus*).

The implementing agency is FWC.

Restoration Type Goals and Project Restoration Objectives

The Restoration Type goal relevant to this project, as identified in the PDARP/PEIS, is:

- 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 restoration objective for this project is:

- Provide and enhance recreational fishing opportunities through aquaculture and release of marine sportfish, specifically red drum and spotted seatrout.

Performance criteria would be used to determine restoration success or the need for corrective action in accordance with 15 Code of Federal Regulations 900.55(b)(1)(vii). Specific, measurable performance criteria are defined, as applicable, for monitoring parameters associated with each of the restoration objectives in Section 3.0.

2 Adaptive Management

Due to the nature of this project, and the use of standard restoration techniques that have been successfully implemented in similar projects, the Florida Trustee Implementation Group (FL TIG) does not anticipate the need for rigorous adaptive management of the project. If project objectives are not being met, the FL TIG would identify corrective actions as necessary.

3 Project Monitoring, Performance Criteria, and Potential Corrective Actions

The proposed monitoring for this restoration project was developed to evaluate project performance, key uncertainties, and potential corrective actions, if needed. Information on each monitoring parameter is provided below, organized by objective (Table 3-1). Note that Table 3-1 does not include all possible options for corrective actions; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected once implemented. Other corrective actions may be identified post-implementation, as appropriate.

Table 3-1 Monitoring Parameters

Objective 1: Provide and enhance recreational fishing opportunities through aquaculture and release of marine sportfish, specifically red drum and spotted seatrout.

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
New: Species, number, and size of hatchery-produced fish released by location	Monitor progress toward meeting restoration objective	Florida Fish and Wildlife Research Institute (FWRI) staff would collect data on species, number, and size of fish produced and released, including release location	Collected at all release events and annually compiled for 2 years following project implementation	Collected during all release events (number and locations to be determined)	Viable fish are released into suitable habitats where they are likely to enhance populations and recreational fishing opportunities	N/A

Type of Performance Monitoring Parameter: Monitoring Parameter (with units)	Reason(s) for Monitoring	Method(s) for Measurement	Timing, Frequency, Duration of Data Collection	Sample Size and Sites	Performance Criteria	Potential Corrective Action(s)
Objective specific: Infrastructure or habitat constructed and/or enhanced and completed as designed	Monitor progress toward meeting restoration objective	Review of contractor reports, on-site inspections, and comparison of construction to "as-built" drawings or other planning materials	Approximately monthly during construction and at the end of construction warranty period, unless otherwise provided by contract	At locations of constructed amenities; approximately monthly during construction, or as necessary	Amenities are constructed and completed as designed and specified in the construction contract	Resolution with contractor such that the terms of the contract are met

4 Monitoring Schedule

The schedule for project monitoring is shown in Table 4-1 by monitoring parameter.

Table 4-1 Monitoring Schedule

Monitoring Parameter	Pre-Execution Monitoring	Execution Monitoring (as-built)	Post-Execution Monitoring
Species, number, and size of hatchery-produced fish released by location	N/A	N/A	X
Infrastructure or Habitat Constructed and/or Enhanced and Completed as Designed	N/A	X	N/A

5 Evaluation

The FL TIG anticipates conducting an evaluation of the project monitoring data collected (as described above) to help answer the following questions:

- Was the project's restoration objective achieved? If not, is there a reason why it was not met?
- Did the project produce unanticipated results?
- Were there unanticipated events related 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?

6 Data Management

Data Description

See Table 3-1 above for details on how data would be recorded, the type of data that would be collected, the data standards that would be followed, the timing and frequency of data collection and processing, the location of data collection, and the quantity of data that are expected.

Data Review and Clearance

FWC-FWRI staff would record data in Excel and send the data and a draft monitoring report to FWC DWH staff within 2 months of the calendar year ending. FWC DWH staff would quality assure/quality control (QA/QC) the monitoring data and report and coordinate with FWC-FWRI staff should any changes be necessary. After all identified errors are addressed, the monitoring data and report would be considered to be QA/QC'ed. FWC would give the other FL TIG members time to review the monitoring data and report before making such information publicly available.

Data Storage and Accessibility

The QA/QC'ed monitoring data and report would be stored in the DIVER Restoration Portal. The data and report would be submitted by FWC within 4 months of the calendar year ending.

Data Sharing

The monitoring data and report would be made publicly available, in accordance with the Federal Open Data Policy, through the DIVER Restoration Portal within 6 months of the calendar year ending.

7 Reporting

Reporting activities for this project include:

- Reporting on general MAM activities in the DIVER Restoration Portal on an annual basis.
- Developing a Final MAM Report before a project is closed out.

8 Roles and Responsibilities

Monitoring data associated with this MAM plan would be collected, reviewed, and reported on by FWC.

9 References

DWH NRDA Trustees. 2016a. *Deepwater Horizon* Oil Spill: Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). Available: www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017 (updated 2019). Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: www.gulfspillrestoration.noaa.gov/.

APPENDIX C. IMPACT INTENSITY DEFINITIONS

The intensity definitions utilized in the evaluation of potential environmental impacts from the reasonable range of alternatives covered in this RP/EA are provided below. These definitions are also provided in Table 6.3-2 in the PDARP/PEIS.

Resource	Impact Duration	Impact Intensity Definitions		
		Minor	Moderate	Major
Geology and Substrates	Short-term: During construction period. Long-term: Over the life of the project or longer.	Disturbance to geologic features or soils could be detectable but could be small and localized. There could be no changes to local geologic features or soil characteristics. Erosion and/or compaction could occur in localized areas.	Disturbance could occur over local and immediately adjacent areas. Impacts to geology or soils could be readily apparent and result in changes to the soil character or local geologic characteristics. Erosion and compaction impacts could occur over local and immediately adjacent areas.	Disturbance could occur over a widespread area. Impacts to geology or soils could be readily apparent and could result in changes to the character of the geology or soils over a 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 ground water 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 (CWA) could not be exceeded. Floodplains: Impacts may result in a detectable change to natural and	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 ground water flows. Water quality: Effects to water quality could be observable over a relatively large area. Impacts could result in a change to water quality that could be readily detectable and limited to local and adjacent areas. Change in water quality could persist; however, it could likely not exceed state water	Hydrology: The effect on hydrology could be measurable and widespread. The effect could permanently alter hydrologic patterns including surface and ground water 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 water body. Floodplains: Impacts could result in a change to natural and beneficial floodplain values that

Resource	Impact Duration	Impact Intensity Definitions		
		Minor	**Moderate**	**Major**
		beneficial floodplain values, but the change could be expected to be small and localized. There could be no appreciable increased risk of flood loss including impacts on human safety, health, and welfare. Wetlands: The effect on wetlands could be measurable but small in 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.	quality standards as required by the CWA. Floodplains: Impacts could result in a change to natural and beneficial floodplain values and could be readily detectable but limited to local and adjacent areas. Location of operations in floodplains could increase risk of flood loss, including impacts on human safety, health, and welfare. 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.	could have substantial consequences over a widespread area. Location of operations could increase risk of flood loss, including impacts on human safety, health, and welfare. Wetlands: The action could cause a permanent loss of wetlands across a 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 U.S. 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 are 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	Increased noise could attract attention and dominate the soundscape over widespread areas. Noise levels could

Resource	Impact Duration	Impact Intensity Definitions		
		Minor	Moderate	Major
			but could not dominate. User activities could be affected.	eliminate or discourage user activities.
Habitats	Short-term: Lasting less than two growing seasons. Long-term: Lasting longer than two growing seasons.	Impacts on native vegetation may be detectable, but could not alter natural conditions and 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 affect local populations negatively but could not be expected to affect regional population stability. Some impacts might occur in key habitats, but sufficient local habitat could retain 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 negative impacts to both local and regional population levels. These disturbances could negatively affect range-wide population stability. Some impacts might occur in key habitats, and habitat impacts could negatively affect the viability of the species both locally and throughout its range. Actions could result in the widespread increase of non-native species, resulting in broad and permanent changes to native species populations and distributions.
Wildlife Species (Including Birds)	Short-term: Lasting up to two breeding seasons, depending on length of breeding season. Long-term: Lasting more than two breeding seasons.	Impacts to native species, their habitats, or the natural processes sustaining them could be detectable, but localized, and could not measurably alter natural conditions. Infrequent responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, resting, migrating, or other factors affecting population levels. Small changes to local population numbers, population	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 negative impacts to feeding, reproduction, resting, migrating, or other factors affecting local population levels. Some impacts might occur in key habitats.	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 negative impacts to feeding, reproduction, migrating, or other factors resulting in a decrease in both local and range-wide population levels and habitat type. Impacts

Resource	Impact Duration	Impact Intensity Definitions		
		Minor	**Moderate**	**Major**
		structure, and other demographic factors could occur. Sufficient habitat could remain functional at both the local and range-wide scales to maintain the viability of the species. Opportunity for increased spread of non-native species could be detectable but temporary and localized, and these species could not displace native species populations and distributions.	However, sufficient population numbers or habitat could retain function to maintain the viability of the species both locally and throughout its range. Opportunity for increased spread of non-native species could be detectable and limited to local and adjacent areas, but could only result in temporary changes to native species population and distributions.	could 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 structure, and other demographic factors might experience large changes or declines. Actions could result in the widespread increase of non-native species resulting in broad and permanent changes to native species populations and distributions.
Marine and Estuarine Fauna (Fish, Shellfish, Benthic Organisms)	Short-term: Lasting up to two spawning seasons, depending on length of season. Long-term: Lasting more than two spawning seasons.	Impacts could be detectable and localized but small. Disturbance of individual species could occur; however, there could be no change in the diversity or local populations of marine and estuarine species. Any disturbance could not interfere with key behaviors such 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	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 resulting in broad and permanent changes to native species populations and distributions.

Resource	Impact Duration	Impact Intensity Definitions		
		Minor	Moderate	Major
			native species population and distributions.	
Protected Species	Short-term: Lasting up to one breeding/growing season. Long-term: Lasting more than one breeding/growing season.	Impacts on protected species, their habitats, or the natural processes sustaining them could be detectable, but 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 listed species.	Impacts on 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 negative impacts to feeding, reproduction, resting, migrating, or other factors affecting local and adjacent population levels. Impacts could occur in key habitats, but sufficient population numbers or habitat could remain functional to maintain the viability of the species both locally and throughout their range. Some disturbance to individuals or impacts to potential or designated critical habitat could occur. Impacts could likely result in a "may affect, likely to adversely affect" determination for at least one listed species. No adverse modification of critical habitat could be expected.	Impacts on protected species, their habitats, or the natural processes sustaining them could be detectable, widespread, and permanent. Substantial impacts to the population numbers of protected species, or interference with their survival, growth, or reproduction could be expected. There could be impacts to key habitat, resulting in substantial reductions in species numbers. Results in an "is likely to jeopardize proposed or listed species/adversely modify proposed or designated critical habitat (impairment)" determination for at least one listed species.
Socioeconomics and Environmental Justice	Short-term: During construction period. Long-term: Over the life of the project or longer.	A few individuals, groups, businesses, properties, or institutions could be affected. Impacts could be small and localized. These impacts are not expected to substantively alter social and/or economic conditions.	Many individuals, groups, businesses, properties, or institutions could be affected. Impacts could be readily apparent and detectable in local and adjacent areas and could have a	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

Resource	Impact Duration	Impact Intensity Definitions		
		Minor	**Moderate**	**Major**
		Actions could not disproportionately affect minority and low-income populations.	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 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.
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 (LOS). 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 LOS to worsened conditions. Extensive service disruptions (temporary closure of 1 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	The action could cause permanent changes to and conflict with land uses or management plans over a widespread area.

Resource	Impact Duration	Impact Intensity Definitions		
		Minor	Moderate	Major
			management in local and adjacent areas.	
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.
Fisheries and Aquaculture	Short-term: During construction period. Long-term: Over the life of the project or longer.	A few individuals, groups, businesses, properties, or institutions could be affected. Impacts could be small and localized. These impacts are not expected to substantively alter social and/or economic conditions.	Many individuals, groups, businesses, properties, or institutions could be 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.	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 could have a substantial influence on social and/or economic conditions.
Marine Transportation	Short-term: During construction period.	The action could affect public services or utilities, but the impact could be localized and within operational capacities.	The action could affect public services or utilities in local and adjacent areas, and the impact could require the acquisition of	The action could affect public services utilities over a widespread area resulting in the

Resource	Impact Duration	Impact Intensity Definitions		
		Minor	Moderate	Major
	Long-term: Over the life of the project or longer.	There could be negligible increases in local daily marine traffic volumes, resulting in perceived inconvenience to operators but no actual disruptions to transportation.	additional service providers or capacity. Detectable increase in daily marine traffic volumes could occur (with slightly reduced speed of travel), resulting in slowed traffic and delays. Short service interruptions could occur (temporary delays for a few hours).	loss of certain services or necessary utilities. Extensive increase in daily marine traffic volumes could occur (with reduced speed of travel), resulting in extensive service disruptions (temporary closure of 1 day or more).
Aesthetics and Visual Resources	Short-term: During construction period. Long-term: Over the life of the project or longer.	There could be a change in the view shed that was readily apparent but could not attract attention, dominate the view, or detract from current user activities or experiences.	There could be a change in the view shed that was readily apparent and 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.
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, ground water, 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, ground water, 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.	Project construction and operation could result in 1) exposure, mobilization and/or migration of existing contaminated soil, ground water, or surface water to an extent that requires mitigation; and/or 2) could introduce detectable levels of contaminants to soil, ground water, and/or surface water in localized areas within the project boundaries such that mitigation/remediation is required to restore the affected area to the preconstruction conditions. Increased risk of potential hazards to visitors, residents, and workers from decreased shoreline integrity	Actions could result in 1) soil, ground water, 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, ground water, 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, ground water, or surface water within the project area, exposing workers and/or the public to contaminated or hazardous

Resource	Impact Duration	Impact Intensity Definitions		
		Minor	Moderate	Major
			could be sufficient to cause a permanent change in use patterns and area avoidance in local and adjacent areas.	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.

APPENDIX D. COUNTY DEMOGRAPHIC INFORMATION

Environmental justice under NEPA is assessed as any disproportionately high adverse effects to low-income, minority, and/or tribal populations. To evaluate the effects of the projects considered in this RP/EA, current demographic data from the U.S. Census Bureau and metrics such as air quality, hazardous waste proximity, and respiratory hazard index, from USEPA were analyzed. The results of this analysis are detailed in this Appendix.

The projects and the demographic data for the counties in which they are located, as well as data for the State of Florida and the entire U.S., are listed in Table D-1. As demonstrated in Table D-1, the demographic data for each county is similar to the State of Florida and the United States as a whole. The percent of white individuals in the proposed project locations range from 61-93 percent relative to the State of Florida and the United States, both approximately 77 percent (U.S. Census Bureau 2019). Across all geographic areas, the percent of the population (aged 25 or older) with a high school education or higher is similar, ranging from 77-93 percent (Florida and U.S. both around 88 percent; U.S. Census Bureau 2018). With respect to poverty, the percent of persons in poverty ranges from 7-25 percent, where the State of Florida is approximately 13 percent and the United States is approximately 11 percent. While there are counties with higher proportions of the population in poverty, none of the projects are anticipated to disproportionately adversely impact those counties.

The USEPA's Environmental Justice Screening and Mapping Tool (Version 2017) was used to assess impacts from the proposed projects regarding human health, the potential for multiple exposures or cumulative exposures, and historical exposures to environmental hazards. Based on the information in that platform, the project locations are below or similar to the State, Region, and U.S. percentiles for particulate matter (PM 2.5), ozone, National-Scale Air Toxics Assessment (NATA) diesel particulate matter, NATA cancer risk, NATA respiratory hazard index, traffic proximity, lead paint indicator, superfund proximity, RMP proximity, hazardous waste proximity, and waste discharge indicator.

Table D-1 County, State, and National Demographic Information

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Bay County, FL	Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years Florida Artificial Reef Creation and Restoration – Phase 2	174,705	82.2%	90.3%	58.5%	$51,829	13.4%
Charlotte County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	188,910	90.6%	90.3%	41.7%	$49,225	11.1%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Citrus County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	149,657	92.9%	88.1%	40.2%	$41,424	15.2%
Collier County, FL	Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	384,902	89.3%	86.4%	52.8%	$65,675	10.6%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Dixie County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	16,826	87.3%	79.3%	36.6%	$38,237	24.7%
Duval County, FL	Northeast Florida Coastal Predation Management Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	957,755	60.6%	89.5%	64.1%	$53,473	14.5%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Escambia County, FL	Johnson Beach Access Management and Habitat Protection Perdido Key Sediment Placement Old Fort Pickens Road Utility Line Relocation Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years Pensacola Community Maritime Park Public Fishing Marina Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades Engineering and Design for Pensacola Beach Park West Fishing Pier and Access Improvements Florida Artificial Reef Creation and Restoration – Phase 2	318,316	68.9%	90.8%	56.9%	$49,286	14.7%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Franklin County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years Florida Artificial Reef Creation and Restoration – Phase 2	12,125	83.3%	80.3%	45.0%	$42,855	22.8%
Gulf County, FL	St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass Florida Artificial Reef Creation and Restoration – Phase 2	13,639	85.1%	84.9%	44.4%	$44,291	20.3%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Hernando County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	193,920	89.6%	87.4%	46.7%	$46,030	14.1%
Hillsborough County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Egmont Key Vegetation Management and Dune Retention Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years Apollo Beach Recreational Sportfish Hatchery Facility	1,471,968	74.1%	88.4%	64.5%	$56,137	14.7%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Jefferson County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	14,246	63.7%	82.1%	45.8%	$48,173	17.9%
Lee County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	770,577	86.8%	88.0%	52.7%	$54,691	12.1%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Levy County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	41,503	87.0%	84.3%	48.9%	$37,634	16.1%
Manatee County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	403,253	86.0%	89.2%	53.5%	$56,036	10.4%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Monroe County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	74,228	89.0%	91.3%	62.8%	$67,023	12.0%
Nassau County, FL	Northeast Florida Coastal Predation Management Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	88,625	90.5%	91.4%	57.4%	$66,297	10.4%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Okaloosa County, FL	Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years Lincoln Park Boat Ramp and Dock Improvements Florida Artificial Reef Creation and Restoration – Phase 2	210,738	81.1%	91.8%	57.7%	$64,048	12.7%
Pasco County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	553,947	87.5%	89.0%	53.3%	$50,417	12.6%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Pinellas County, FL	Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	974,996	82.5%	91.1%	57.8%	$51,454	11.7%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Santa Rosa County, FL	Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years Gulf Breeze Parks Boating and Fishing Access Upgrades Florida Artificial Reef Creation and Restoration – Phase 2	184,313	86.9%	91.6%	56.4%	$66,242	9.5%
Sarasota County, FL	Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	433,742	91.5%	92.8%	48.5%	$58,644	10.3%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
St. Johns County, FL	Northeast Florida Coastal Predation Management Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	264,672	88.6%	94.6%	59.7%	$77,323	6.6%
Taylor County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years	21,569	76.0%	77.4%	37.7%	$36,934	21.6%
Walton County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years Florida Artificial Reef Creation and Restoration – Phase 2	74,071	89.6%	88.5%	57.5%	$53,785	11.4%

Location	Project(s) in Associated County	Population (2019)	Percent White Alone (2019)	Percent of population age 25 or older with high school education or higher (2014-2018)	Percent of population age 16 or older in civilian labor force (2014-2018)	Median household income, 2016 dollars (2014-2018)	Percent of persons in poverty
Wakulla County, FL	Reducing Threats to Sea Turtles through Removal of In-water Marine Debris along Florida's Gulf Coast Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast Florida Gulf Coast Marine Mammal Stranding Network Reducing Injury and Mortality of Bottlenose Dolphins in Florida from Illegal Feeding Activities Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years Florida Artificial Reef Creation and Restoration – Phase 2	33,739	82.4%	87.9%	54.5%	$62,778	11.9%
Florida	N/A	21,477,737	77.3%	88.0%	58.3%	$53,267	12.7%
United States	N/A	328,239,523	76.3%	87.7%	62.9%	$60,293	10.5%

Source: United States Census Bureau. 2019. QuickFacts. Accessed 10/30/2020. www.census.gov/quickfacts/fact/table/US/PST045217

APPENDIX E. FEDERALLY PROTECTED SPECIES

The table below provides a list of federally listed species potentially occurring within each location for the proposed alternatives. Associated habitat information is also provided for each species.

Table E-1 Federally listed species potentially occurring in the Gulf Islands National Seashore (Florida)[71]

Common Name	Scientific Name	Habitat	Status	Likelihood
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T	Unlikely
Giant manta ray	*Manta birostris*	Marine: various.	T	Potentially
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Unlikely
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T	Potentially
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T, CH	Likely
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Leatherback sea turtle	*Dermochelys coriacea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T, CH	Potentially
Perdido Key beach mouse	*Peromyscus polionotus trissyllepsis*	Terrestrial: sand dunes with a moderate cover of grasses and forbs.	E, CH	Likely
Piping plover	*Charadrius melodus*	Estuarine: exposed unconsolidated substrate; Marine: exposed unconsolidated substrate; Terrestrial: dunes, sandy beaches, and inlet areas; mostly wintering and migrants.	T	Likely
Reticulated flatwoods salamander	*Ambystoma bishopi*	Palustrine: wet flatwoods, dome swamp, basin swamp; Terrestrial: mesic flatwoods (reproduces in ephemeral wetlands within this community).	E	Unlikely
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E, CH	Likely
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T	Likely
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding); Palustrine: marshes, swamps, roadside ditches.	T	Unlikely
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis.				

[71] Four alternatives are proposed for implementation at Gulf Islands National Seashore: FM1, Johnson Beach Access Management and Habitat Projection (preferred), FM2, Perdido Key Sediment Placement (preferred), FM3, Old Fort Pickens Road Utility Line Relocation, and FM4, Pensacola Beach Fort Pickens Road Wildlife Lighting Retrofits (preferred).

Common Name	Scientific Name	Habitat	Status	Likelihood
C=Candidate, CH=Critical Habitat, E=Endangered, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-2 Federally listed species potentially occurring in the FM5/REC6, St. Vincent National Wildlife Refuge Access and Recreational Improvements through Acquisition at Indian Pass and REC7, St. Vincent National Wildlife Refuge Recreational Improvements at Indian Pass project areas

Common Name	Scientific Name	Habitat	Status	Likelihood
Chapman rhododendron	*Rhododendron chapmanii*	Terrestrial: open pinelands.	E	Unlikely
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T	Unlikely
Florida skullcap	*Scutellaria floridana*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T	Unlikely
Giant manta ray	*Manta birostris*	Marine: various.	T	Potentially
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Unlikely
Godfrey's butterwort	*Pinguicula ionantha*	Palustrine: seepage bogs in grassy pine flatwoods and grassy savannahs.	T	Unlikely
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest on sandy beaches.	T	Potentially
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Leatherback sea turtle	*Dermochelys coriacea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T, CH	Potentially
Piping plover	*Charadrius melodus*	Estuarine: exposed unconsolidated substrate; Marine: exposed unconsolidated substrate; Terrestrial: dunes, sandy beaches, and inlet areas; mostly wintering and migrants.	T	Potentially
Red knot	*Calidris canutus rufa*	Estuarine: bays, tidal flats, salt marshes; Marine: aerial, near shore; Terrestrial: sandy beaches; mostly wintering and migrants.	T	Likely
St. Andrew beach mouse	*Peromyscus polionotus peninsularis*	Terrestrial: frontal and scrub dunes characterized by high levels of vegetative or scrub cover.	E	Unlikely

Common Name	Scientific Name	Habitat	Status	Likelihood
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E, CH	Likely
Telephus spurge	*Euphorbia telephioides*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T	Unlikely
White birds-in-a-nest	*Macbridea alba*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T	Unlikely
Wood stork	*Mycteria americana*	Estuarine: marshes Lacustrine: floodplain lakes, marshes (feeding) Palustrine: marshes, swamps, roadside ditches.	T	Likely
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-3 Federally listed species potentially occurring in the ST1, Increased Observers and Outreach to Reduce Incidental Hooking of Sea Turtles in Recreational Fisheries along Florida's Gulf Coast project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Aboriginal prickly-apple	*Harrisia aboriginus*	Terrestrial: coastal strand, grasslands, and berms, maritime hammocks, shell mounds.	E	Unlikely
American alligator	*Alligator mississipiensis*	Estuarine: herbaceous wetland; Riverine: river, creek, low gradient, medium river, pool, spring/spring brook; Lacustrine: shallow water; Palustrine: forested wetland, herbaceous wetland, riparian, scrub-shrub wetland.	SAT	Unlikely
American crocodile	*Crocodylus acutus*	Estuarine: herbaceous wetland; Riverine: river, creek, low gradient, medium river, pool, spring/spring brook; Lacustrine: shallow water; Palustrine: forested wetland, herbaceous wetland, riparian, scrub-shrub wetland.	T	Unlikely
Bartram's hairstreak butterfly	*Strymon acis bartrami*	Terrestrial: pine rockland, rockland hammock, hydric pine flatwoods.	E	Unlikely
Eastern black rail	*Laterallus jamaicensis ssp. jamaicensis*	Estuarine: herbaceous wetland with elevated refugia; Palustrine: herbaceous wetland with elevated refugia.	T	Unlikely
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods rockland hammock, ruderal.	T	Unlikely
Florida bonamia	*Bonamia grandiflora*	Terrestrial: sand pine scrub vegetation with evergreen scrub oaks and sand pine.	T	Unlikely
Florida bonneted bat	*Eumops floridanus*	Palustrine: forested wetland, herbaceous wetland, scrub-shrub wetland; Terrestrial: upland forest, upland shrub.	E	Unlikely
Florida golden aster	*Chrysopsis floridana*	Terrestrial: sand pine-evergreen oak scrub.	E	Unlikely
Florida leafwing butterfly	*Anaea troglodyte floridalis*	Terrestrial: pine rockland, rockland hammock, hydric pine flatwoods.	E	Unlikely
Florida panther	*Puma concolor coryi*	Terrestrial: upland forest containing dense understory vegetation.	E	Unlikely
Florida perforate cladonia	*Cladonia perforata*	Terrestrial: well-drained sands of rosemary scrub habitat.	E	Unlikely
Florida prairie-clover	*Dalea carthagenesis floridana*	Terrestrial: pine rockland, rockland hammock, marl prairie, and coastal berm.	E	Unlikely
Florida scrub-jay	*Aphelocoma coerulescens*	Terrestrial: upland scrub-shrub.	T	Unlikely
Florida skullcap	*Scutellaria floridana*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T	Unlikely
Garber's spurge	*Chamaesyce garberi*	Terrestrial: open areas on dry, sandy soil.	T	Unlikely
Giant manta ray	*Manta birostris*	Marine: various.	T	Potentially

Common Name	Scientific Name	Habitat	Status	Likelihood
Godfrey's butterwort	*Pinguicula ionantha*	Palustrine: seepage bogs in grassy pine flatwoods and grassy savannahs.	T	Unlikely
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Unlikely
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest on sandy beaches.	T	Likely
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T, CH	Likely
Harper's beauty	*Harperocallis flava*	Palustrine: seepage savannahs, cypress swamps, pine flatwoods bog.	E	Unlikely
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Likely
Ivory-billed woodpecker	*Campephilus principalis*	Terrestrial: bottomland hardwood forest, especially bald cypress forest in Florida.	E	Unlikely
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Likely
Leatherback sea turtle	*Dermochelys coricea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T, CH	Likely
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*	Terrestrial: hardwood hammocks, coastal berm hammocks, dunes, and scrub.	E	Unlikely
Panama City crayfish	*Procambarus econfinae*	Estuarine: flatwood wetlands; Palustrine: flatwood wetlands.	PT	Unlikely
Piping plover	*Charadrius melodus*	Estuarine: exposed unconsolidated substrate; Marine: exposed unconsolidated substrate; Terrestrial: dunes, sandy beaches, and inlet areas; mostly wintering and migrants.	T	Potentially
Puma	*Pyma concolor subsp.*	Terrestrial: upland forest containing dense understory vegetation.	SAT	Unlikely
Pygmy fringe-tree	*Chionanthus pygmaeus*	Terrestrial: sand pine-evergreen oak scrub vegetation.	E	Unlikely
Red knot	*Calidris canutus rufa*	Estuarine: bays, tidal flats, salt marshes; Terrestrial: sandy beaches, mostly wintering and migrants; Marine: aerial, near shore.	T	Potentially
Reticulated flatwoods salamander	*Ambysoma bishop*	Palustrine: wet flatwoods, dome swamp, basin swamp;	E	Unlikely

Common Name	Scientific Name	Habitat	Status	Likelihood
		Terrestrial: mesic flatwoods (reproduces in ephemeral wetlands within this community).		
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E	Potentially
Telephus spurge	*Euphorbia telephioides*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T	Unlikely
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T	Likely
White birds-in-a-nest	*Macbridea alba*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T	Unlikely
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding); Palustrine: marshes, swamps, roadside ditches.	T	Unlikely
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, PT=Proposed Threatened, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-4 Federally listed species potentially occurring in the ST2, Reducing Threats to Sea Turtles through Removal of In-water Marine Debris Along Florida's Gulf Coast and MM1, Florida Gulf Coast Marine Mammal Stranding Network project areas[72]

Common Name	Scientific Name	Habitat	Status
Aboriginal prickly-apple	*Harrisia aboriginus*	Terrestrial: coastal strand, grasslands, and berms, maritime hammocks, shell mounds.	E, CH
Alabama beach mouse	*Peromyscus polionotus ammobates*	Terrestrial: primary and secondary dunes dominated by sea oats, scrub dunes dominated by scrub oaks.	E
American alligator	*Alligator mississipiensis*	Estuarine: herbaceous wetland Riverine: river, creek, low gradient, medium river, pool, spring/spring brook; Lacustrine: shallow water; Palustrine: forested wetland, herbaceous wetland, riparian, scrub-shrub wetland.	SAT
American crocodile	*Crocodylus acutus*	Estuarine: herbaceous wetland; Riverine: river, creek, low gradient, medium river, pool, spring/spring brook; Lacustrine: shallow water; Palustrine: forested wetland, herbaceous wetland, riparian, scrub-shrub wetland.	T, CH
Audubon's crested caracara	*Polyborus plancus audubonii*	Terrestrial: upland prairie containing wet areas and scattered cabbage palm.	T
Bachman's warbler	*Vermivora bachmanii*	Palustrine: forested wetlands containing dense palmetto or cane understory.	E
Bartram's hairstreak butterfly	*Strymon acis bartrami*	Terrestrial: pine rockland, rockland hammock, hydric pine flatwoods.	E, CH
Beach jacquemontia	*Jacquemontia reclinata*	Terrestrial: tropical maritime hammock or coastal strand vegetation.	E
Beautiful pawpaw	*Deeringothamnus pulchellus*	Terrestrial: grassy flatwoods.	E
Big pine partridge pea	*Chamaecrista lineata keyensis*	Terrestrial: pine rocklands and rockland hammocks.	E
Blodgett's silverbush	*Argythamnia blodgettii*	Terrestrial: pine rocklands and rockland hammocks.	T
Boulder star coral	*Orbicella franski*	Marine: shallow waters.	T
Brooksville bellflower	*Campanula robinsiae*	Palustrine: pond margins, wet prairies, or seepage areas in hardwood forests.	E
Cape Sable seaside sparrow	*Ammodramus maritimus mirabilis*	Palustrine: freshwater herbaceous marl prairies.	E
Cape Sable thoroughwort	*Chromolaena frustrata*	Terrestrial: coastal berms, buttonwood forests, coastal hardwood hammocks, rockland hammocks.	E, CH
Carter's mustard	*Warea carteri*	Terrestrial: sandhills and scrubby flatwoods.	E
Carter's small-flowered flax	*Linum carteri carteri*	Terrestrial: pine rockland.	E
Chapman rhododendron	*Rhododendron chapmanii*	Terrestrial: open pinelands.	E

[72] Since project activities would be implemented across Florida's Gulf Coast, any species listed within Table E-4 could possibly be present in the project area.

Common Name	Scientific Name	Habitat	Status
Choctaw bean	*Villosa choctawensis*	Riverine: creeks, streams, and rivers with silty sand or sandy clay substrates.	E
Choctawhatchee beach mouse	*Peromyscus polionotus allophrys*	Terrestrial: primary and secondary dunes dominated by sea oats, scrub dunes dominated by scrub oaks.	E, CH
Cooley's water-willow	*Justicia cooleyi*	Terrestrial: hardwood forests with limestone substrate.	E
Crenulate lead-plant	*Amorpha crenulate*	Terrestrial: pine rockland.	E
Deltoid spurge	*Chamaesyce deltoidei ssp. Deltoidei*	Terrestrial: pine rockland.	E
Eastern black rail	*Laterallus jamaicensis ssp. jamaicensis*	Estuarine: herbaceous wetland with elevated refugia; Palustrine: herbaceous wetland with elevated refugia.	T
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T
Elkhorn coral	*Acropora palmata*	Marine: shallow coastal waters in high-energy wave zones.	T
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	Lacustrine: shallow waters characterized by sawgrass and cattail stands; Palustrine: open freshwater marsh with low, sparse vegetation.	E
Everglades bully	*Sideroxylon reclinatum ssp. austrofloridense*	Terrestrial: pine rockland and marl prairie.	T
Florida bonamia	*Bonamia grandiflora*	Terrestrial: sand pine scrub vegetation with evergreen scrub oaks and sand pine.	T
Florida bonneted bat	*Eumops floridanus*	Palustrine: forested wetland, herbaceous wetland, scrub-shrub wetland; Terrestrial: upland forest, upland shrub	E, CH
Florida brickell-bush	*Brickellia mosieri*	Terrestrial: pine rockland.	E
Florida bristle fern	*Trichomanes punctatum ssp. floridanum*	Terrestrial: hardwood forest hammock.	E
Florida golden aster	*Chrysopsis floridana*	Terrestrial: sand pine-evergreen oak scrub.	E
Florida grasshopper sparrow	*Ammodramus savannarum floridanus*	Terrestrial: dry prairie grasslands.	E
Florida leafwing butterfly	*Anaea troglodyte floridalis*	Terrestrial: pine rockland, rockland hammock, hydric pine flatwoods.	E, CH
Florida panther	*Puma concolor coryi*	Terrestrial: upland forest containing dense understory vegetation.	E
Florida perforate cladonia	*Cladonia perforata*	Terrestrial: well-drained sands of rosemary scrub habitat.	E
Florida pineland crabgrass	*Digitaria pauciflora*	Terrestrial: pine rockland and marl prairie.	T
Florida prairie-clover	*Dalea carthagenesis floridana*	Terrestrial: pine rockland, rockland hammock, marl prairie, and coastal berm.	E

Common Name	Scientific Name	Habitat	Status
Florida salt marsh vole	*Microtus pennsylvanicus dukecampbelli*	Estuarine: grassy salt marsh	E
Florida semaphore cactus	*Consolea corallicola*	Terrestrial: coastal berms, buttonwood forests, rockland hammocks.	E, CH
Florida scrub-jay	*Aphelocoma coerulescens*	Terrestrial: upland scrub-shrub.	T
Florida skullcap	*Scutellaria floridana*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T
Frosted flatwoods salamander	*Ambystoma cingulatum*	Palustrine: wet flatwoods, dome swamp, basin swamp; Terrestrial: mesic flatwoods (reproduces in ephemeral wetlands within this community).	T
Fuzzy pigtoe	*Pleurobema strodeanum*	Riverine: medium creeks to medium rivers characterized by sand and silty sand substrate	T
Garber's spurge	*Chamaesyce garberi*	Terrestrial: open areas on dry, sandy soil.	T
Giant manta ray	*Manta birostris*	Marine: various.	T
Godfrey's butterwort	*Pinguicula ionantha*	Palustrine: seepage bogs in grassy pine flatwoods and grassy savannahs.	T
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T
Gulf moccasinshell	*Medionidus penicillatus*	Riverine: streams characterized by sand, gravel, and/or cobble substrate; larval stages parasitize fish hosts	E
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T, CH
Harper's beauty	*Harperocallis flava*	Palustrine: seepage savannahs, cypress swamps, pine flatwoods bog.	E
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E
Ivory-billed woodpecker	*Campephilus principalis*	Terrestrial: bottomland hardwood forest, especially baldcypress forest in Florida.	E
Kemp's Ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E
Key deer	*Odocoileus virginianus clavium*	Terrestrial: upland pine rockland and hardwood hammock	E
Key Largo cotton mouse	*Peromyscus gossypinus allapaticola*	Terrestrial: upland hardwood hammock forest.	E
Key Largo woodrat	*Neotoma floridana smalli*	Terrestrial: upland hardwood hammock forest.	E
Key tree cactus	*Pilosocereus robinii*	Terrestrial: rocky hammocks.	E
Leatherback sea turtle	*Dermochelys coricea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E

Common Name	Scientific Name	Habitat	Status
Lobed star coral	*Orbicella annularis*	Marine: nearshore shallow water.	T
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T, CH
Lower keys marsh rabbit	*Sylvilagus palustris hefneri*	Estuarine: vegetated salt marsh Palustrine: vegetated fresh-water marsh.	E
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*	Terrestrial: hardwood hammocks, coastal berm hammocks, dunes, and scrub.	E
Mountainous star coral	*Orbicella faveolata*	Marine: nearshore shallow water.	T
Narrow pigtoe	*Pusconaia escambia*	Riverine: medium creeks to medium rivers characterized by sand or sand and gravel substrate.	T
Oceanic whitetip shark	*Carcharhinus longimanus*	Marine: open ocean and outer continental shelf.	T
Okaloosa darter	*Etheostoma okaloosae*	Riverine: streams with high levels of detritus, root mats, and vegetation.	T
Oval pigtoe	*Pleurobema pyriforme*	Riverine: streams characterized by sand, gravel, and/or cobble substrate; larval stages parasitize fish hosts.	E
Panama City crayfish	*Procambarus econfinae*	Estuarine: flatwood wetlands; Palustrine: flatwood wetlands.	PT
Papery whitlow-wort	*Paronychia chartacea*	Terrestrial: xeric scrubby flatwoods and rosemary scrub.	T
Perdido Key beach mouse	*Peromyscus polionotus trissyllepsis*	Terrestrial: sand dunes with a moderate cover of grasses and forbs.	E
Pineland sandmat	*Chamaesyce deltoidea ssp. pinetorum*	Terrestrial: pine rocklands.	T
Piping plover	*Charadrius melodus*	Estuarine: exposed unconsolidated substrate; Marine: exposed unconsolidated substrate; Terrestrial: dunes, sandy beaches, and inlet areas; mostly wintering and migrants.	T, CH
Puma	*Pyma concolor subsp.*	Terrestrial: upland forest containing dense understory vegetation.	SAT
Pygmy fringe-tree	*Chionanthus pygmaeus*	Terrestrial: sand pine-evergreen oak scrub vegetation.	E
Red-cockaded woodpecker	*Dryobates (=Picoides) borealis*	Terrestrial: mature pine forests.	E
Red knot	*Calidris canutus rufa*	Estuarine: bays, tidal flats, salt marshes; Terrestrial: sandy beaches, mostly wintering and migrants; Marine: aerial, near shore.	T
Reticulated flatwoods salamander	*Ambysoma bishop*	Palustrine: wet flatwoods, dome swamp, basin swamp; Terrestrial: mesic flatwoods (reproduces in ephemeral wetlands within this community).	E
Roseate tern	*Sterna dougallii dougallii*	Terrestrial: various nesting sites; Marine: various foraging sites.	T
Round ebonyshell	*Rusconaia rotulata*	Riverine: small to medium rivers characterized by sand, small gravel, or sandy mud substrate.	E
Sand flax	*Linum arenicola*	Terrestrial: pine rockland.	E

Common Name	Scientific Name	Habitat	Status
Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	Terrestrial: hardwood hammocks within the Florida Keys.	E
Shinyrayed pocketbook	*Lampsilis subangulata*	Riverine: streams characterized by sand, gravel, and/or cobble substrate; larval stages parasitize fish hosts.	E
Silver rice rat	*Oryzomys palustris natator*	Estuarine: mangrove swamps, vegetated saltmarsh flats; Palustrine: vegetated marshes.	E, CH
Small's milkpea	*Galactia smallii*	Terrestrial: pine rockland.	E
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E, CH
Southern kidneyshell	*Ptychobranchus jonesi*	Riverine: medium creeks to small rivers characterized by firm sand substrate.	E
Southern sandshell	*Hamiota australis*	Riverine: small creeks and rivers characterized by sand or sand and fine gravel substrate.	T
St. Andrew beach mouse	*Peromyscus polionotus peninsularis*	Terrestrial: frontal and scrub dunes characterized by high levels of vegetative or scrub cover.	E, CH
Stock Island tree snail	*Orthalicus reses (not incl. nesodryas)*	Terrestrial: tropical hardwood hammock.	T
Telephus spurge	*Euphorbia telephioides*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T
Tiny polygala	*Polygala smallii*	Terrestrial: pine rockland.	E
Wedge spurge	*Chamaesyce deltoidea serpyllum*	Terrestrial: pine rockland.	E
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T, CH
White birds-in-a-nest	*Macbridea alba*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T
Whooping crane	*Grus americana*	Lacustrine: marshes; Palustrine: shallow, vegetated wetlands; Terrestrial: dry prairie and flatwoods.	EXPN
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding); Palustrine: marshes, swamps, roadside ditches.	T
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, EXPN=Experimental Non-Essential, PT=Proposed Threatened, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.			

Table E-5 Federally listed species potentially occurring in the ST3, Assessing Risk and Conducting Public Outreach to Reduce Vessel Strikes on Sea Turtles along Florida's Gulf Coast project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Giant manta ray	*Manta birostris*	Marine: various.	T	Potentially
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T	Likely
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T, CH	Likely
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Likely
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Likely
Leatherback sea turtle	*Dermochelys coricea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T, CH	Likely
Oceanic whitetip shark	*Carcharhinus longimanus*	Marine: open ocean and outer continental shelf.	T	Potentially
Piping plover	*Charadrius melodus*	Estuarine: exposed unconsolidated substrate; Marine: exposed unconsolidated substrate; Terrestrial: dunes, sandy beaches, and inlet areas; mostly wintering and migrants.	T, CH	Unlikely
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E, CH	Likely
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T, CH	Likely
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, EXPN=Experimental Non-Essential, PT=Proposed Threatened, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-6 Federally listed species potentially occurring in the ST4, Removal of Barriers on Sea Turtle Nesting Beaches along Florida's Gulf Coast project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Aboriginal prickly-apple	*Harrisia aboriginus*	Terrestrial: coastal strand, grasslands, and berms, maritime hammocks, shell mounds.	E, CH	Unlikely
Alabama beach mouse	*Peromyscus polionotus ammobates*	Terrestrial: primary and secondary dunes dominated by sea oats, scrub dunes dominated by scrub oaks.	E	Likely
American alligator	*Alligator mississipiensis*	Estuarine: herbaceous wetland; Riverine: river, creek, low gradient, medium river, pool, spring/spring brook; Lacustrine: shallow water; Palustrine: forested wetland, herbaceous wetland, riparian, scrub-shrub wetland.	SAT	Potentially
American crocodile	*Crocodylus acutus*	Estuarine: herbaceous wetland; Riverine: river, creek, low gradient, medium river, pool, spring/spring brook; Lacustrine: shallow water; Palustrine: forested wetland, herbaceous wetland, riparian, scrub-shrub wetland.	T, CH	Potentially
Bachman's warbler	*Vermivora bachmanii*	Palustrine: forested wetlands containing dense palmetto or cane understory.	E	Unlikely
Bartram's hairstreak butterfly	*Strymon acis bartrami*	Terrestrial: pine rockland, rockland hammock, hydric pine flatwoods.	E, CH	Unlikely
Beautiful pawpaw	*Deeringothamnus pulchellus*	Terrestrial: grassy flatwoods.	E	Unlikely
Big pine partridge pea	*Chamaecrista lineata keyensis*	Terrestrial: pine rocklands and rockland hammocks.	E	Unlikely
Blodgett's silverbush	*Argythamnia blodgettii*	Terrestrial: pine rocklands and rockland hammocks.	T	Unlikely
Brooksville bellflower	*Campanula robinsiae*	Palustrine: pond margins, wet prairies, or seepage areas in hardwood forests.	E	Unlikely
Cape Sable thoroughwort	*Chromolaena frustrata*	Terrestrial: coastal berms, buttonwood forests, coastal hardwood hammocks, rockland hammocks.	E, CH	Unlikely
Chapman rhododendron	*Rhododendron chapmanii*	Terrestrial: open pinelands.	E	Unlikely
Choctawhatchee beach mouse	*Peromyscus polionotus allophrys*	Terrestrial: primary and secondary dunes dominated by sea oats, scrub dunes dominated by scrub oaks.	E, CH	Potentially
Eastern black rail	*Laterallus jamaicensis ssp. jamaicensis*	Estuarine: herbaceous wetland with elevated refugia; Palustrine: herbaceous wetland with elevated refugia.	T	Unlikely
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T	Unlikely
Everglades bully	*Sideroxylon reclinatum ssp. austrofloridense*	Terrestrial: pine rockland and marl prairie.	T	Unlikely

Common Name	Scientific Name	Habitat	Status	Likelihood
Florida bonamia	*Bonamia grandiflora*	Terrestrial: sand pine scrub vegetation with evergreen scrub oaks and sand pine.	T	Unlikely
Florida bonneted bat	*Eumops floridanus*	Palustrine: forested wetland, herbaceous wetland, scrub-shrub wetland; Terrestrial: upland forest, upland shrub.	E, CH	Unlikely
Florida golden aster	*Chrysopsis floridana*	Terrestrial: sand pine-evergreen oak scrub.	E	Potentially
Florida leafwing butterfly	*Anaea troglodyte floridalis*	Terrestrial: pine rockland, rockland hammock, hydric pine flatwoods.	E, CH	Unlikely
Florida panther	*Puma concolor coryi*	Terrestrial: upland forest containing dense understory vegetation.	E	Unlikely
Florida perforate cladonia	*Cladonia perforata*	Terrestrial: well-drained sands of rosemary scrub habitat.	E	Unlikely
Florida pineland crabgrass	*Digitaria pauciflora*	Terrestrial: pine rockland and marl prairie.	T	Unlikely
Florida prairie-clover	*Dalea carthagenesis floridana*	Terrestrial: pine rockland, rockland hammock, marl prairie, and coastal berm.	E	Unlikely
Florida semaphore cactus	*Consolea corallicola*	Terrestrial: coastal berms, buttonwood forests, rockland hammocks.	E, CH	Unlikely
Florida scrub-jay	*Aphelocoma coerulescens*	Terrestrial: upland scrub-shrub.	T	Unlikely
Florida skullcap	*Scutellaria floridana*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T	Unlikely
Garber's spurge	*Chamaesyce garberi*	Terrestrial: open areas on dry, sandy soil.	T	Unlikely
Godfrey's butterwort	*Pinguicula ionantha*	Palustrine: seepage bogs in grassy pine flatwoods and grassy savannahs.	T	Unlikely
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Unlikely
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T	Potentially
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T, CH	Potentially
Harper's beauty	*Harperocallis flava*	Palustrine: seepage savannahs, cypress swamps, pine flatwoods bog.	E	Unlikely
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Ivory-billed woodpecker	*Campephilus principalis*	Terrestrial: bottomland hardwood forest, especially baldcypress forest in Florida.	E	Unlikely
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Key deer	*Odocoileus virginianus clavium*	Terrestrial: upland pine rockland and hardwood hammock.	E	Unlikely

Common Name	Scientific Name	Habitat	Status	Likelihood
Key Largo cotton mouse	*Peromyscus gossypinus allapaticola*	Terrestrial: upland hardwood hammock forest.	E	Unlikely
Key tree cactus	*Pilosocereus robinii*	Terrestrial: rocky hammocks.	E	Unlikely
Leatherback sea turtle	*Dermochelys coricea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T, CH	Potentially
Lower Keys marsh rabbit	*Sylvilagus palustris hefneri*	Estuarine: vegetated salt marsh; Palustrine: vegetated fresh-water marsh.	E	Unlikely
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*	Terrestrial: hardwood hammocks, coastal berm hammocks, dunes, and scrub.	E	Unlikely
Panama City crayfish	*Procambarus econfinae*	Estuarine: flatwood wetlands; Palustrine: flatwood wetlands.	PT	Unlikely
Perdido Key beach mouse	*Peromyscus polionotus trissyllepsis*	Terrestrial: sand dunes with a moderate cover of grasses and forbs.	E	Potentially
Piping plover	*Charadrius melodus*	Estuarine: exposed unconsolidated substrate; Marine: exposed unconsolidated substrate; Terrestrial: dunes, sandy beaches, and inlet areas; mostly wintering and migrants.	T, CH	Potentially
Puma	*Pyma concolor subsp.*	Terrestrial: upland forest containing dense understory vegetation.	SAT	Unlikely
Pygmy fringe-tree	*Chionanthus pygmaeus*	Terrestrial: sand pine-evergreen oak scrub vegetation.	E	Unlikely
Red-cockaded woodpecker	*Dryobates (=Picoides) borealis*	Terrestrial: mature pine forests.	E	Unlikely
Red knot	*Calidris canutus rufa*	Estuarine: bays, tidal flats, salt marshes; Terrestrial: sandy beaches, mostly wintering and migrants; Marine: aerial, near shore.	T	Potentially
Reticulated flatwoods salamander	*Ambysoma bishop*	Palustrine: wet flatwoods, dome swamp, basin swamp; Terrestrial: mesic flatwoods (reproduces in ephemeral wetlands within this community).	E	Unlikely
Roseate tern	*Sterna dougallii dougallii*	Terrestrial: various nesting sites; Marine: various foraging sites.	T	Potentially
Sand flax	*Linum arenicola*	Terrestrial: pine rockland.	E	Unlikely
Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	Terrestrial: hardwood hammocks within the Florida Keys.	E	Unlikely
Silver rice rat	*Oryzomys palustris natator*	Estuarine: mangrove swamps, vegetated saltmarsh flats; Palustrine: vegetated marshes.	E, CH	Unlikely
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds;	E, CH	Potentially

Common Name	Scientific Name	Habitat	Status	Likelihood
		Marine: shallow coastal waters with muddy or sandy bottoms.		
St. Andrew beach mouse	*Peromyscus polionotus peninsularis*	Terrestrial: frontal and scrub dunes characterized by high levels of vegetative or scrub cover.	E, CH	Potentially
Stock Island tree snail	*Orthalicus reses (*not incl. *nesodryas)*	Terrestrial: tropical hardwood hammock.	T	Unlikely
Telephus spurge	*Euphorbia telephioides*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T	Unlikely
Wedge spurge	*Chamaesyce deltoidea serpyllum*	Terrestrial: pine rockland.	E	Unlikely
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T, CH	Potentially
Whooping crane	*Grus americana*	Lacustrine: marshes; Palustrine: shallow, vegetated wetlands; Terrestrial: dry prairie and flatwoods.	EXPN	Unlikely
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding); Palustrine: marshes, swamps, roadside ditches.	T	Potentially
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, EXPN=Experimental Non-Essential, PT=Proposed Threatened, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-7 Federally listed species potentially occurring in the B1, Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Eastern black rail	*Laterallus jamaicensis ssp. jamaicensis*	Estuarine: herbaceous wetland with elevated refugia; Palustrine: herbaceous wetland with elevated refugia.	T	Potentially
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T	Unlikely
Florida salt marsh vole	*Microtus pennsylvanicus dukecampbelli*	Estuarine: grassy salt marsh.	E	Unlikely
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Unlikely
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T	Potentially
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T	Potentially
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Leatherback sea turtle	*Dermochelys coricea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T, CH	Potentially
Red knot	*Calidris canutus rufa*	Estuarine: bays, tidal flats, salt marshes; Terrestrial: sandy beaches, mostly wintering and migrants; Marine: aerial, near shore.	T	Potentially
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E	Potentially
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T	Potentially
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding);	T	Potentially

Common Name	Scientific Name	Habitat	Status	Likelihood
		Palustrine: marshes, swamps, roadside ditches.		
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, EXPN=Experimental Non-Essential, PT=Proposed Threatened, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-8 Federally listed species potentially occurring in the B2, Egmont Key Vegetation Management and Dune Retention project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Brooksville bellflower	*Campanula robinsiae*	Palustrine: pond margins, wet prairies, or seepage areas in hardwood forests.	E	Unlikely
Eastern black rail	*Laterallus jamaicensis ssp. jamaicensis*	Estuarine: herbaceous wetland with elevated refugia; Palustrine: herbaceous wetland with elevated refugia.	T	Potentially
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T	Potentially
Florida bonamia	*Bonamia grandiflora*	Terrestrial: sand pine scrub vegetation with evergreen scrub oaks and sand pine.	T	Unlikely
Florida golden aster	*Chrysopsis floridana*	Terrestrial: sand pine-evergreen oak scrub.	E	Unlikely
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Potentially
Hawksbill sea turtle	*Eretmochelys imbricata*	Forages around coral reefs; spends time in Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Leatherback sea turtle	*Dermochelys coricea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T	Potentially
Piping plover	*Charadrius melodus*	Estuarine: exposed unconsolidated substrate; Marine: exposed unconsolidated substrate; Terrestrial: dunes, sandy beaches, and inlet areas; mostly wintering and migrants.	T, CH	Potentially
Pygmy fringe-tree	*Chionanthus pygmaeus*	Terrestrial: sand pine-evergreen oak scrub vegetation.	E	Unlikely
Red knot	*Calidris canutus rufa*	Estuarine: bays, tidal flats, salt marshes; Terrestrial: sandy beaches, mostly wintering and migrants; Marine: aerial, near shore.	T	Potentially
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T	Unlikely
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding); Palustrine: marshes, swamps, roadside ditches.	T	Potentially

Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis.
C=Candidate, CH=Critical Habitat, E=Endangered, EXPN=Experimental Non-Essential, PT=Proposed Threatened, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.

Table E-9 Federally listed species potentially occurring in the B3, Northeast Florida Coastal Predation Management project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Anastasia Island beach mouse	*Peromyscus polionotus phasma*	Terrestrial: primary and secondary dunes dominated by sea oats, scrub dunes dominated by scrub oaks.	E	Potentially
Eastern black rail	*Laterallus jamaicensis ssp. jamaicensis*	Estuarine: herbaceous wetland with elevated refugia; Palustrine: herbaceous wetland with elevated refugia.	T	Potentially
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T	Potentially
Florida scrub-jay	*Aphelocoma coerulescens*	Terrestrial: upland scrub-shrub.	T	Potentially
Frosted flatwoods salamander	*Ambystoma cingulatum*	Palustrine: wet flatwoods, dome swamp, basin swamp; Terrestrial: mesic flatwoods (reproduces in ephemeral wetlands within this community).	T	Potentially
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Potentially
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T	Potentially
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Leatherback sea turtle	*Dermochelys coricea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T, CH	Potentially
Piping plover	*Charadrius melodus*	Estuarine: exposed unconsolidated substrate; Marine: exposed unconsolidated substrate; Terrestrial: dunes, sandy beaches, and inlet areas; mostly wintering and migrants.	T, CH	Potentially
Red knot	*Calidris canutus rufa*	Estuarine: bays, tidal flats, salt marshes; Terrestrial: sandy beaches, mostly wintering and migrants; Marine: aerial, near shore.	T	Potentially
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T, CH	Unlikely
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding);	T	Potentially

Common Name	Scientific Name	Habitat	Status	Likelihood
		Palustrine: marshes, swamps, roadside ditches.		
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, EXPN=Experimental Non-Essential, PT=Proposed Threatened, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-10 Federally listed species potentially occurring in the B4, Florida Shorebird and Seabird Stewardship and Habitat Management – 5 Years and B5, Florida Shorebird and Seabird Stewardship and Habitat Management – 10 Years project areas[73]

Common Name	Scientific Name	Habitat	Status
Aboriginal prickly-apple	*Harrisia aboriginus*	Terrestrial: coastal strand, grasslands, and berms, maritime hammocks, shell mounds.	E, CH
Alabama beach mouse	*Peromyscus polionotus ammobates*	Terrestrial: primary and secondary dunes dominated by sea oats, scrub dunes dominated by scrub oaks.	E
American alligator	*Alligator mississipiensis*	Estuarine: herbaceous wetland; Riverine: river, creek, low gradient, medium river, pool, spring/spring brook; Lacustrine: shallow water; Palustrine: forested wetland, herbaceous wetland, riparian, scrub-shrub wetland.	SAT
American crocodile	*Crocodylus acutus*	Estuarine: herbaceous wetland; Riverine: river, creek, low gradient, medium river, pool, spring/spring brook; Lacustrine: shallow water; Palustrine: forested wetland, herbaceous wetland, riparian, scrub-shrub wetland.	T, CH
Bachman's warbler	*Vermivora bachmanii*	Palustrine: forested wetlands containing dense palmetto or cane understory.	E
Bartram's hairstreak butterfly	*Strymon acis bartrami*	Terrestrial: pine rockland, rockland hammock, hydric pine flatwoods.	E, CH
Beautiful pawpaw	*Deeringothamnus pulchellus*	Terrestrial: grassy flatwoods.	E
Big pine partridge pea	*Chamaecrista lineata keyensis*	Terrestrial: pine rocklands and rockland hammocks.	E
Blodgett's silverbush	*Argythamnia blodgettii*	Terrestrial: pine rocklands and rockland hammocks.	T
Brooksville bellflower	*Campanula robinsiae*	Palustrine: pond margins, wet prairies, or seepage areas in hardwood forests.	E
Cape Sable thoroughwort	*Chromolaena frustrata*	Terrestrial: coastal berms, buttonwood forests, coastal hardwood hammocks, rockland hammocks.	E, CH
Chapman rhododendron	*Rhododendron chapmanii*	Terrestrial: open pinelands.	E
Choctawhatchee beach mouse	*Peromyscus polionotus allophrys*	Terrestrial: primary and secondary dunes dominated by sea oats, scrub dunes dominated by scrub oaks	E, CH
Eastern black rail	*Laterallus jamaicensis ssp. jamaicensis*	Estuarine: herbaceous wetland with elevated refugia Palustrine: herbaceous wetland with elevated refugia	T
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T
Everglades bully	*Sideroxylon reclinatum ssp. austrofloridense*	Terrestrial: pine rockland and marl prairie.	T
Florida bonamia	*Bonamia grandiflora*	Terrestrial: sand pine scrub vegetation with evergreen scrub oaks and sand pine.	T
Florida bonneted bat	*Eumops floridanus*	Palustrine: forested wetland, herbaceous wetland, scrub-shrub wetland Terrestrial: upland forest, upland shrub	E, CH

[73] Since project activities would be implemented across Florida's Gulf Coast and select sites along the Northeast Coast, any species listed within Table E-4 could possibly be present in the project area.

Common Name	Scientific Name	Habitat	Status
Florida golden aster	*Chrysopsis floridana*	Terrestrial: sand pine-evergreen oak scrub.	E
Florida leafwing butterfly	*Anaea troglodyte floridalis*	Terrestrial: pine rockland, rockland hammock, hydric pine flatwoods	E, CH
Florida panther	*Puma concolor coryi*	Terrestrial: upland forest containing dense understory vegetation	E
Florida perforate cladonia	*Cladonia perforata*	Well-drained sands of rosemary scrub habitat.	E
Florida pineland crabgrass	*Digitaria pauciflora*	Terrestrial: pine rockland and marl prairie.	T
Florida prairie-clover	*Dalea carthagenesis floridana*	Terrestrial: pine rockland, rockland hammock, marl prairie, and coastal berm.	E
Florida semaphore cactus	*Consolea corallicola*	Terrestrial: coastal berms, buttonwood forests, rockland hammocks.	E, CH
Florida scrub-jay	*Aphelocoma coerulescens*	Terrestrial: upland scrub-shrub	T
Florida skullcap	*Scutellaria floridana*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T
Garber's spurge	*Chamaesyce garberi*	Terrestrial: open areas on dry, sandy soil.	T
Godfrey's butterwort	*Pinguicula ionantha*	Palustrine: seepage bogs in grassy pine flatwoods and grassy savannahs.	T
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T
Harper's beauty	*Harperocallis flava*	Palustrine: seepage savannahs, cypress swamps, pine flatwoods bog.	E
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E
Ivory-billed woodpecker	*Campephilus principalis*	Terrestrial: bottomland hardwood forest, especially baldcypress forest in Florida	E
Kemp's Ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E
Key deer	*Odocoileus virginianus clavium*	Terrestrial: upland pine rockland and hardwood hammock	E
Key Largo woodrat	*Neotoma floridana smalli*	Terrestrial: upland hardwood hammock forest	E
Key tree cactus	*Pilosocereus robinii*	Terrestrial: rocky hammocks.	E
Leatherback sea turtle	*Dermochelys coricea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T, CH
Lower keys marsh rabbit	*Sylvilagus palustris hefneri*	Estuarine: vegetated salt marsh Palustrine: vegetated fresh-water marsh	E

Common Name	Scientific Name	Habitat	Status
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*	Terrestrial: hardwood hammocks, coastal berm hammocks, dunes, and scrub	E
Perdido Key beach mouse	*Peromyscus polionotus trissyllepsis*	Terrestrial: sand dunes with a moderate cover of grasses and forbs.	E
Piping plover	*Charadrius melodus*	Estuarine: exposed unconsolidated substrate; Marine: exposed unconsolidated substrate; Terrestrial: dunes, sandy beaches, and inlet areas; mostly wintering and migrants.	T, CH
Puma	*Pyma concolor subsp.*	Terrestrial: upland forest containing dense understory vegetation	SAT
Pygmy fringe-tree	*Chionanthus pygmaeus*	Terrestrial: sand pine-evergreen oak scrub vegetation.	E
Red-cockaded woodpecker	*Dryobates (=Picoides) borealis*	Terrestrial: mature pine forests.	E
Red knot	*Calidris canutus rufa*	Estuarine: bays, tidal flats, salt marshes; Terrestrial: sandy beaches, mostly wintering and migrants; Marine: aerial, near shore.	T
Reticulated flatwoods salamander	*Ambysoma bishop*	Palustrine: wet flatwoods, dome swamp, basin swamp; Terrestrial: mesic flatwoods (reproduces in ephemeral wetlands within this community).	E
Roseate tern	*Sterna dougallii dougallii*	Terrestrial: various nesting sites Marine: various foraging sites	T
Sand flax	*Linum arenicola*	Terrestrial: pine rockland.	E
Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	Terrestrial: hardwood hammocks within the Florida Keys	E
Silver rice rat	*Oryzomys palustris natator*	Estuarine: mangrove swamps, vegetated saltmarsh flats Palustrine: vegetated marshes	E
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E, CH
St. Andrew beach mouse	*Peromyscus polionotus peninsularis*	Terrestrial: frontal and scrub dunes characterized by high levels of vegetative or scrub cover.	E, CH
Stock island tree snail	*Orthalicus reses (not incl. nesodryas)*	Terrestrial: tropical hardwood hammock	T
Telephus spurge	*Euphorbia telephioides*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T
Wedge spurge	*Chamaesyce deltoidea serpyllum*	Terrestrial: pine rockland.	E
White birds-in-a-nest	*Macbridea alba*	Palustrine: edges of forested or shrubby wetlands, seepage bogs; Terrestrial: savannahs.	T
Whooping crane	*Grus americana*	Lacustrine: marshes Palustrine: shallow, vegetated wetlands Terrestrial: dry prairie and flatwoods	EXPN
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding); Palustrine: marshes, swamps, roadside ditches.	T

Common Name	Scientific Name	Habitat	Status
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, EXPN=Experimental Non-Essential, PT=Proposed Threatened, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.			

Table E-11 Federally listed species potentially occurring in the REC1, Pensacola Community Maritime Park Public Fishing Marina project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T	Unlikely
Giant manta ray	*Manta birostris*	Marine: various.	T	Potentially
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Unlikely
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T	Potentially
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T, CH	Likely
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Leatherback sea turtle	*Dermochelys coriacea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T	Potentially
Reticulated flatwoods salamander	*Ambystoma bishopi*	Palustrine: wet flatwoods, dome swamp, basin swamp; Terrestrial: mesic flatwoods (reproduces in ephemeral wetlands within this community).	E	Unlikely
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E	Potentially
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T	Likely
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding); Palustrine: marshes, swamps, roadside ditches.	T	Unlikely
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-12 Federally listed species potentially occurring in the REC2, Baars Park and Sanders Beach Kayak Fishing Trail Access Upgrades project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T	Potentially
Giant manta ray	*Manta birostris*	Marine: various.	T	Potentially
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Potentially
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T	Potentially
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T, CH	Likely
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Leatherback sea turtle	*Dermochelys coriacea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T	Potentially
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E	Potentially
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T	Likely
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding); Palustrine: marshes, swamps, roadside ditches.	T	Unlikely
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-13 Federally listed species potentially occurring in the REC4, Gulf Breeze Parks Boating and Fishing Access Upgrades project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T	Unlikely
Giant manta ray	*Manta birostris*	Marine: various.	T	Potentially
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Unlikely
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T	Potentially
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T, CH	Likely
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Leatherback sea turtle	*Dermochelys coriacea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T	Potentially
Reticulated flatwoods salamander	*Ambystoma bishopi*	Palustrine: wet flatwoods, dome swamp, basin swamp; Terrestrial: mesic flatwoods (reproduces in ephemeral wetlands within this community).	E	Unlikely
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E	Potentially
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T	Likely
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding); Palustrine: marshes, swamps, roadside ditches.	T	Unlikely
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-14 Federally listed species potentially occurring in REC5, Lincoln Park Boat Ramp and Dock Improvements project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Eastern indigo snake	*Drymarchon corais couperi*	Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal.	T	Unlikely
Giant manta ray	*Manta birostris*	Marine: various.	T	Potentially
Gopher tortoise	*Gopherus polyphemus*	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal.	C	Unlikely
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T	Potentially
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T, CH	Likely
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Potentially
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Leatherback sea turtle	*Dermochelys coriacea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Unlikely
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T	Potentially
Okaloosa darter	*Etheostoma okaloosae*	Riverine: streams with high levels of detritus, root mats, and vegetation.	T	Unlikely
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E	Potentially
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T	Likely
Wood stork	*Mycteria americana*	Estuarine: marshes; Lacustrine: floodplain lakes, marshes (feeding); Palustrine: marshes, swamps, roadside ditches.	T	Unlikely
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat. E=Endangered, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				

Table E-15 Federally listed species potentially occurring in the REC8, Florida Artificial Reef Creation and Restoration – Phase 2 project area

Common Name	Scientific Name	Habitat	Status	Likelihood
Bryde's whale	*Balaenoptera edeni* (Gulf subspecies)	Marine: continental shelf break.	E	Potentially
Giant manta ray	*Manta birostris*	Marine: various.	T	Potentially
Green sea turtle	*Chelonia mydas*	Estuarine: near seagrasses; Marine: coastal waters, breeds adjacent to the shoreline; Terrestrial: nest; on sandy beaches.	T	Potentially
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Estuarine: various; Marine: various habitats; Riverine: alluvial and blackwater streams.	T, CH	Likely
Hawksbill sea turtle	*Eretmochelys imbricata*	Estuarine: bays and estuaries; Marine: forages around coral reefs, breeds adjacent to shoreline; Terrestrial: nests on sandy beaches.	E	Likely
Kemp's ridley sea turtle	*Lepidochelys kempii*	Marine: forages in sargassum and open waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Likely
Leatherback sea turtle	*Dermochelys coricea*	Marine: forages in the open ocean waters, breeds in deep waters adjacent to the shoreline; Terrestrial: nests on sandy beaches.	E	Likely
Loggerhead sea turtle	*Caretta caretta*	Marine: forages in the open ocean and shallow coastal waters, breeds adjacent to the shoreline; Terrestrial: nests on sandy beaches.	T, CH	Likely
Oceanic whitetip shark	*Carcharhinus longimanus*	Marine: open ocean and outer continental shelf.	T	Potentially
Smalltooth sawfish	*Pristis pectinata*	Estuarine: shallow habitats such as inshore bars, mangrove edges, and seagrass beds; Marine: shallow coastal waters with muddy or sandy bottoms.	E	Potentially
West Indian manatee	*Trichechus manatus*	Estuarine: SAV, open water; Marine: open water, SAV.	T, CH	Potentially
Note: Species determined to be "Unlikely" to be found in the action area are not addressed further in this analysis. C=Candidate, CH=Critical Habitat, E=Endangered, EXPN=Experimental Non-Essential, PT=Proposed Threatened, T=Threatened, SAT=Similarity of Appearance (Threatened), SSC=Species of Special Concern.				