CHAPTER 12: PROPOSED PHASE III EARLY RESTORATION PROJECTS: FLORIDA (continued)

CHAPTER 12: PROPOSED PHASE III EARLY RESTORATION PROJECTS: FLORIDA (continued) i

12.6 Florida Cat Point Living Shoreline Project: Project Description 1

12.6.1 Project Summary 1

12.6.2 Background and Project Description 1

12.6.3 Evaluation Criteria 3

12.6.4 Performance Criteria, Monitoring and Maintenance 4

12.6.5 Offsets 5

12.6.6 Cost 5

12.7 Florida Cat Point Living Shoreline Project: Environmental Review 6

12.7.1 Introduction and Background 6

12.7.2 Project Location 7

12.7.3 Construction and Installation 10

12.7.4 Operations and Maintenance 12

12.7.5 Affected Environment and Environmental Consequences 12

12.7.6 Summary and Next Steps 32

12.7.7 References 33

12.8 Florida Pensacola Bay Living Shoreline Project: Project Description 37

12.8.1 Project Summary 37

12.8.2 Introduction and Background 37

12.8.3 Evaluation Criteria 39

12.8.4 Performance Criteria, Monitoring and Maintenance 40

12.8.5 Offsets 41

12.8.6 Cost 41

12.9 Florida Pensacola Bay Living Shoreline Project: Environmental Review 42

12.9.1 Introduction and Background 42

12.9.2 Project Location 43

12.9.3 Construction and Installation 44

12.9.4 Operations and Maintenance 47

12.9.5 Affected Environment and Environmental Consequences 48

12.9.6 Summary and Next Steps 82

12.9.7 References 83
12.10 Florida Seagrass Recovery Project: Project Description 89
12.10.1 Project Summary 89
12.10.2 Background and Project Description 89
12.10.3 Evaluation Criteria 90
12.10.4 Performance Criteria, Monitoring and Maintenance 91
12.10.5 Offsets 92
12.10.6 Cost 92
12.11 Florida Seagrass Recovery Project: Environmental Review 93
12.11.1 Introduction and Background 93
12.11.2 Project Location 93
12.11.3 Construction and Installation 95
12.11.4 Operations and Maintenance 99
12.11.5 Affected Environment and Environmental Consequences 100
12.11.6 Summary and Next Steps 118
12.11.7 References 119
12.12 Perdido Key State Park Beach Boardwalk Improvements: Project Description 122
12.12.1 Project Summary 122
12.12.2 Background and Project Description 122
12.12.3 Evaluation Criteria 122
12.12.4 Performance Criteria, Monitoring and Maintenance 124
12.12.5 Offsets 125
12.12.6 Cost 125
12.13 Perdido Key State Park Beach Boardwalk Improvements: Environmental Review 126
12.13.1 Introduction and Background 126
12.13.2 Project Location 127
12.13.3 Construction and Installation 127
12.13.4 Operations and Maintenance 129
12.13.5 Affected Environment and Environmental Consequences 129
12.13.6 Summary and Next Steps 145
12.13.7 References 146
12.14 Big Lagoon State Park Boat Ramp Improvement: Project Description 148
12.14.1 Project Summary 148
12.14.2 Background and Project Description 148

12.14.3 Evaluation Criteria 149
12.14.4 Performance Criteria, Monitoring and Maintenance 150
12.14.5 Offsets 151
12.14.6 Cost 151
12.15 Big Lagoon State Park Boat Ramp Improvement: Environmental Review 152
12.15.1 Introduction and Background 152
12.15.2 Project Location 153
12.15.3 Construction and Installation 153
12.15.4 Operations and Maintenance 158
12.15.5 Affected Environment and Environmental Consequences 158
12.15.6 Summary and Next Steps 187
12.15.7 References 188
12.16 Bob Sikes Pier, Parking and Trail Restoration: Project Description 192
12.16.1 Project Summary 192
12.16.2 Background and Project Description 192
12.16.3 Evaluation Criteria 193
12.16.4 Performance Criteria, Monitoring and Maintenance 194
12.16.5 Offsets 194
12.16.6 Cost 195
12.17 Bob Sikes Pier, Parking and Trail Restoration: Environmental Review 196
12.17.1 Introduction and Background 196
12.17.2 Project Location 197
12.17.3 Construction and Installation 197
12.17.4 Operations and Maintenance 197
12.17.5 Affected Environment and Environmental Consequences 198
12.17.6 Summary and Next Steps 208
12.17.7 References 209
12.18 Florida Artificial Reef Creation and Restoration: Project Description 210
12.18.1 Project Summary 210
12.18.2 Background and Project Description 210
12.18.3 Evaluation Criteria 210
12.18.4 Performance Criteria, Monitoring and Maintenance 211
12.18.5 Offsets 212
12.18.6 Cost 212

12.19 Florida Artificial Reef Creation and Restoration: Environmental Review 213
12.19.1 Introduction and Background 213
12.19.2 Project Location 214
12.19.3 Construction and Installation 214
12.19.4 Operations and Maintenance 220
12.19.5 Affected Environment and Environmental Consequences 220
12.19.6 Summary and Next Steps 239
12.19.7 References 240
12.20 Florida Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center: Project Description 244
12.20.1 Project Summary 244
12.20.2 Background and Project Description 244
12.20.3 Evaluation Criteria 245
12.20.4 Performance Criteria, Monitoring and Maintenance 246
12.20.5 Offsets 247
12.20.6 Cost 247
12.21 Florida Fish Hatchery: Environmental Review 248
12.21.1 Introduction and Background 248
12.21.2 Project Location 249
12.21.3 Construction and Installation 254
12.21.4 Operations and Maintenance 258
12.21.5 Affected Environment and Environmental Consequences 260
12.21.6 Summary and Next Steps 281
12.21.7 References 282
12.22 Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle: Project Description 286
12.22.1 Project Summary 286
12.22.2 Background and Project Description 286
12.22.3 Evaluation Criteria 286
12.22.4 Performance Criteria, Monitoring and Maintenance 288
12.22.5 Offsets 288
12.22.6 Cost 289
12.23 Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle: Environmental Review 290
12.23.1 Introduction and Background 290

12.23.2 Project Location 291
12.23.3 Construction and Installation 293
12.23.4 Operations and Maintenance 294
12.23.5 Affected Environment and Environmental Consequences 294
12.23.6 Summary and Next Steps 315
12.23.7 References 316
12.24 Shell Point Beach Nourishment: Project Description 320
12.24.1 Project Summary 320
12.24.2 Background and Project Description 320
12.24.3 Evaluation Criteria 321
12.24.4 Performance Criteria, Monitoring and Maintenance 322
12.24.5 Offsets 322
12.24.6 Cost 323
12.25 Shell Point Beach Nourishment: Environmental Review 324
12.25.1 Introduction and Background 324
12.25.2 Project Location 325
12.25.3 Construction and Installation 325
12.25.4 Operations and Maintenance 327
12.25.5 Affected Environment and Environmental Consequences 328
12.25.6 Summary and Next Steps 338
12.25.7 References 338
12.26 Perdido Key Dune Restoration Project: Project Description 340
12.26.1 Summary Project Information 340
12.26.2 Background and Project Description 340
12.26.3 Selection Criteria 340
12.26.4 Performance Criteria, Monitoring and Maintenance 342
12.26.5 Offsets 342
12.26.6 Cost 343
12.27 Perdido Key Dune Restoration Project: Environmental Review 344
12.27.1 Introduction and Background 344
12.27.2 Project Location 345
12.27.3 Construction and Installation 346
12.27.4 Operations and Maintenance 347
12.27.5 Affected Environment and Environmental Consequences 347

12.27.6 Summary and Next Steps 364
12.27.7 References 364
12.28 Florida Oyster Cultch Placement Project: Project Description 367
12.28.1 Project Summary 367
12.28.2 Background and Project Description 367
12.28.3 Evaluation Criteria 368
12.28.4 Performance Criteria, Monitoring and Maintenance 369
12.28.5 Offsets 370
12.28.6 Cost 371
12.29 Florida Oyster Cultch Placement Project: Environmental Review 372
12.29.1 Introduction and Background 372
12.29.2 Project Location 373
12.29.3 Construction and Installation 373
12.29.4 Operations and Maintenance 378
12.29.5 Affected Environment and Environmental Consequences 380
12.29.6 Summary and Next Steps 399
12.29.7 References 400

12.6 Florida Cat Point Living Shoreline Project: Project Description

12.6.1 Project Summary

The proposed Cat Point (Franklin County) Living Shoreline project is intended to employ living shoreline techniques that utilize natural and/or artificial breakwater material to reduce shoreline erosion and provide habitat off Eastpoint, Florida. Combining these objectives, this project would create breakwaters to reduce wave energy, increase benthic secondary productivity, and create salt marsh habitat. Proposed activities include expanding an existing breakwater by creating up to 0.3 miles of new breakwater that will provide reef habitat and creating salt marsh habitat. The total estimated cost for this project is $775,605.

12.6.2 Background and Project Description

The Trustees propose to implement living shoreline techniques at the Apalachicola National Estuarine Research Reserve (ANERR) Office Complex and Nature Center in Eastpoint, Florida in Franklin County (see Figure 12-1 for General location and Figure 12-2 for additional project details). This area has been the location of previous successful living shoreline projects that contribute to shoreline protection. The constructed breakwater would also serve to protect approximately 1 acre of salt marsh habitat that would be planted as part of the project as well as limiting future erosion.

Combining the objectives of reducing shoreline erosion and providing habitat, this project would create breakwaters to reduce wave energy, increase benthic secondary productivity, and create salt marsh habitat. The restoration work proposed includes placing the breakwater structures approximately 30 feet from the shoreline, which would likely have an approximate 5 foot crest width with a height that falls within the mean high and low water lines of the site. The specific breakwater elevation and technique design would be selected to maximize shoreline protection and meet state regulatory requirements. The living shoreline techniques would be employed along approximately 0.3 mile of shoreline. Additionally, plugs of Saltmarsh Cordgrass *(Spartina alterniflora)* would be planted on 2to3 foot centers in the area located landward of the breakwater. Plants would be installed within 30-days of the first growing period subsequent to construction of the breakwater. The restoration methods proposed here are established methods for this type of restoration project.

Figure 12-1. General location of envisioned Cat Point (Franklin County) Living Shoreline Project.

Figure 12-2. Detailed location of envisioned Cat Point (Franklin County) Living Shoreline Project.

12.6.3 Evaluation Criteria

This proposed project meets the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and associated response activities, benthic secondary productivity and salt marshes along the north central Gulf coast suffered adverse impacts. This project seeks to foster reef development and salt marsh habitat, which would help compensate the public for Spill-related injuries and losses to benthic secondary productivity and salt marsh habitats. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

The project is technically feasible and utilizes proven techniques with established methods and documented results. Florida agencies have successfully implemented similar projects in the region. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Furthermore, the cost estimates are based on similar past projects and therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.6, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration. In addition, the best management practices and

measures to avoid or minimize adverse impacts described in 12.6 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). The project is part of the long-term restoration and resource management plans of the Apalachicola NERR and therefore is consistent with long term restoration needs of the State. See Section 6d of the Framework Agreement.

Many ecological projects, including ones similar to this project, were submitted as a restoration project on the NOAA website (http://www.gulfrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Cat Point living shoreline project also meets the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area in which boom was deployed and that was impacted by response and SCAT activities for the Spill.

12.6.4 Performance Criteria, Monitoring and Maintenance

As part of the project costs, monitoring would be conducted to ensure project designs were correctly implemented and to evaluate project effectiveness. Performance criteria would be used to determine project success or the need for corrective actions. The monitoring has been designed around the following project objectives: 1) to protect created marsh habitat from erosion, and 2) to promote reef development for bivalves and other invertebrates. Monitoring activities would be planned for 5 years following the completion of the project and are estimated to cost approximately $62,578. Specific success criteria include: 1) the construction of breakwaters that meet project design criteria, support benthic secondary productivity, reduce wave energy affecting the shoreline, and are sustained for the expected life of the project; 2) the creation of salt marsh habitat that meets project design criteria and achieves the designed percent cover by native saltmarsh vegetation; and 3) the reduction of shoreline erosion which protects created salt marsh habitat.

Baseline monitoring would be conducted to collect data that would be used as a point of comparison for implementation and post implementation monitoring data. Implementation monitoring would be conducted to ensure that the breakwaters were constructed with the appropriate dimensions. In general, components of this monitoring would potentially evaluate the production and support of organisms on the breakwater (e.g., benthic secondary productivity), the stability of the breakwater protecting the shoreline (e.g., salt marsh habitat) and the creation of salt marsh habitat. Performance criteria would be established to determine whether the project achieves the desired breakwater specifications, benthic secondary productivity, and salt marsh habitat created.

Components of this monitoring may include collecting information with respect to:

- Structural integrity of breakwater/reef structure;
- Height/elevation and width of breakwater/reef structure;
- Consolidation rate of breakwater/reef structure;
- Shoreline (salt marsh) profile;
- Shoreline (salt marsh) position;
- Bivalve density, size, biomass, and survival;
- Non-bivalve invertebrate density and biomass; and
- Percent cover and survival of planted marsh vegetation.

Adaptive management procedures will be used to correct deficiencies or maintenance needs identified through monitoring. Furthermore, a minimum of 80 percent of the plantings must be viable at the end of the first growing season subsequent to initial planting. Viable area coverage shall be monitored in following years to ensure establishment of salt marsh vegetation. Monitoring of the plantings would occur for a minimum of 5 years with a minimum of one site inspection per year. Annual reports and photographs would be prepared during the monitoring period.

12.6.5 Offsets

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Habitat Equivalency Analysis and Resource Equivalency Analysis to estimate appropriate biological and habitat Offsets for the Cat Point Living Shoreline Project. Habitat Offsets (expressed in DSAYs) were estimated for salt marsh habitat protected by this restoration, based on the expected spatial extent and duration of improvements attributable to the project. In estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, anticipated protection of created salt marsh habitat provided by the project and the time period over which the project would continue to provide benefits. The Trustees and BP agreed that if this restoration is selected for implementation, BP would receive Offsets of 4.3 DSAYs of Salt Marsh Habitat in Florida, applicable to Salt Marsh Habitat injuries in Florida, as determined by the Trustees' total assessment of injury for the Spill.

Benthic Secondary Productivity Offsets (expressed in DKg-Ys) were estimated for expected increases in invertebrate infaunal and epifaunal biomass attributable to the project. In estimating DKg-Ys, the Trustees considered a number of factors, including, but not necessarily limited to, typical productivity in the project area, estimated project lifespan and project size. The Trustees and BP agreed that if this restoration is selected for implementation, BP would receive Offsets of 3,266 DKg-Ys of benthic Secondary Productivity in Florida, applicable to benthic Secondary Productivity injuries in Florida, as determined by the Trustees' total assessment of injury for the Spill. If the Offsets exceed the benthic Secondary Productivity injury in Florida, the Trustees and BP will apply "excess" Offsets to injuries to benthic Secondary Productivity within Federal waters on the Continental Shelf, excluding those associated with mesophotic reefs. These Offsets would not apply to injuries in Mississippi, Alabama, Louisiana and/or Texas.

These Offset types and amounts are reasonable for this project.

12.6.6 Cost

The total estimated cost to implement this project is $775,605. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and potential contingencies.

12.7 Florida Cat Point Living Shoreline Project: Environmental Review

The proposed Cat Point (Franklin County) Living Shoreline project would use living shoreline techniques including natural and/or artificial breakwater material to stabilize shorelines along an area just off the Apalachicola National Estuarine Research Reserve (ANERR) Office Complex and Nature Center, Eastpoint, Florida. This project would expand on an existing breakwater, creating up to 0.3 mile breakwater to dampen wave energy and create salt marsh habitat. This area has been the location of previous successful living shorelines projects that contribute to shoreline protection. The constructed breakwaters would serve to protect approximately 1 acre of salt marsh habitat that would be plantedby the project as well as limiting future erosion.

The breakwater/living shoreline method would be employed along approximately 0.3 mile of shoreline. The structures would likely be placed approximately 30 feet from the shoreline and would likely have an approximately 5-foot crest width with a height that falls within the mean high and low water lines of the site. The specific breakwater elevation and technique would be selected during the design and permitting stage to maximize shoreline protection and meet state regulatory requirements.

12.7.1 Introduction and Background

In April 2011, the Natural Resource Trustees (Trustees) and BP Exploration and Production, Inc. (BP) entered into the Framework Agreement for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* oil spill (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is underway. The Framework Agreement is intended to expedite the start of restoration in the Gulf of Mexico in advance of the completion of the injury assessment process. Early restoration is not intended to, and does not, fully address all injuries caused by the spill. Restoration beyond Early Restoration projects would be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement, after public review of a draft, the Trustees released a Phase I Early Restoration Plan (ERP) in April 2012. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, the National Oceanic and Atmospheric Administration (NOAA) issued a public notice in the *Federal Register* on behalf of the Trustees, announcing the development of additional future Early Restoration projects for a Draft Phase III ERP.

This living shoreline project in Franklin County was submitted as an Early Restoration project on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the state of Florida. In addition to meeting the evaluation criteria for the Framework Agreement and Oil Pollution Act (OPA), the project meets Florida criteria that Early Restoration projects occur in the eight-county panhandle area that deployed boom and was impacted by the Spill.

Apalachicola Bay is located in the northwestern region of Florida. To reduce erosion and restore habitat, living shoreline and marsh creation techniques can be used to stabilize eroding shorelines by dampening wave energy while also providing habitat that was once present in the project area.

Building on previous efforts that were used as mitigation measures for other projects, the Florida Department of Environmental Protection (FDEP) isproposing to employ living shoreline techniques in Apalachicola Bay to reduce shoreline erosion and enhance habitat. The proposed project would construct approximately 1 acre of salt marsh to protect and restore areas that experienced the highest rates of erosion. The breakwaters would create a total of 0.3 mile of intertidal reef to protect the shallow embayment and created salt marsh habitat.

This project would also address the impacts to habitat and biota caused by the *Deepwater Horizon* oil spill (see Code of Federal Regulations [C.F.R.] 990.54(a)(2) and Sections 6a–6c of the Framework Agreement) using established techniques (Gulf and Atlantic States Marine Fisheries Commissions 2004). State and local government agencies have successfully completed similar projects, including an earlier phase of a similar project in Apalachicola Bay at the same location.

12.7.2 Project Location

The proposed Cat Point Living Shoreline Early Restoration project is located along the northwestern portion of St. George Sound, approximately 6 miles east of Apalachicola in Franklin County, Florida. The site is east of the St. George Island bridge on property owned by the state and managed by the ANERR (Figure 12-3 and

Figure 12-4).

Figure 12-3. Project location map, Franklin County, Florida.

Figure 12-4. Project location map on aerial photograph, Franklin County, Florida.

12.7.3 Construction and Installation

12.7.3.1 Engineering and Design

Building upon the experience of FDEP on similar efforts, such as the original Cat Point Living Shoreline, breakwaters would be constructed along selected shoreline in Apalachicola Bay. Construction activities would include placement of linear structures that may use natural rock or shell-based materials, or both. The proposed project depths are approximately 1 to 2 feet below mean lower low water (MLLW) at the existing breakwater. The specific breakwater elevation and technique would be selected during design and permitting to maximize shoreline protection and meet state regulatory requirements.

The breakwater/living shoreline method would be employed along approximately 0.3 mile of shoreline. The structures would be placed approximately 30 feet from the shoreline and have an approximately 5-foot crest width with a height that falls within the mean high and low water lines of the site. Additionally, the project would create and restore approximately 1 acre of salt marsh habitat. One of the breakwater units could be constructed with bagged shell material while the other would probably be constructed of rock riprap. Gaps would be constructed between the units, which would be a minimum

of 3 feet wide, to minimize the risk of species entrapment. No long-term maintenance is anticipated for the breakwaters after materials are placed and stabilized.

Construction of the breakwaters would occur during winter months (November through early March) when the extreme low tides would leave the breakwater material placement area exposed so materials can be placed from shore using a combination of cranes or backhoes. The project placement area will be accessed by an existing road (Millender Street). The location for the placement of the breakwater materials, along with any preferred transportation paths, will be marked during construction using PVC stakes that would be driven by hand using a post driver or other means into the sediment. Following final materials placement these stakes would be removed. Materials and equipment would be staged in the state-owned lands adjacent to the road right-of-way. Preliminary construction details are as follows:

Northern Structure—Riprap Structure
Total project length = 689 feet
Crest width = 5 feet
Assumed bottom elevation = −1.5 feet, MLLW (based upon nautical charts)
Total structure height = 2.5 feet [(5.24−4.29) − (−1.5) = 2.45 feet → 2.5 feet]
Bagged shell veneer depth = 0.50 foot
Riprap depth = 1.50 feet
Estimate initial settlement = 0.5 foot
Design side slopes are 2 horizontal to 1 vertical
Breakwater distance from shoreline = 30 feet
Reach of each breakwater = 70 feet
Length of each gap between breakwater = up to 25 feet, with a minimum 3 foot gap

Southern Structure—Bagged Shell Structure
Total project length = 750 feet
Crest width = 5 feet
Assumed bottom elevation = −1.5 feet, MLLW (based upon nautical charts)
Total structure height = 2.5 feet [(5.24−4.29) − (−1.5) = 2.45 feet → 2.5 feet]
Bagged shell veneer depth = 0.50 foot
Riprap depth = 1.50 feet
Estimate initial settlement = 0.5 foot
Design side slopes are 2 horizontal to 1 vertical
Breakwater distance from shoreline = 30 feet
Reach of each breakwater = 70 feet
Length of each gap between breakwater = up to 25 feet, with a minimum 3 foot gap

During construction, the *Sea turtle and Smalltooth Sawfish Construction Guidelines* (NOAA, 2006), the *Standard Manatee Conditions for In-water Work* (USFWS, 2011), and *Measures for Reducing Entrapment Risk to Protected Species* (NOAA, 2012) will be implemented.

In addition, vegetative plantings would be installed behind the breakwater structures along the shoreline for approximately 1 acre of marsh creation. Marsh construction would involve planting of native marsh plant species on 2- to 3-foot centers. This activity would commence once the constructed

breakwater material placement is complete and stabilized so the restored areas would be protected to the fullest extent possible.

12.7.4 Operations and Maintenance

Monitoring would be conducted to ensure project designs are correctly implemented and to evaluate project effectiveness. Performance criteria would be used to determine project success or the need for corrective actions. The monitoring has been designed around the project objectives, which are to protect created marsh habitat from erosion and to promote reef development for bivalves and other invertebrates. Monitoring activities are planned for 5 years following the completion of the project. Specific success criteria includes the construction of breakwaters that meet project design criteria, support benthic secondary productivity, reduce wave energy affecting the shoreline, and are sustained for the expected life of the project.Also included is the creation of salt marsh habitat that meets project design criteria and achieves the designed percent cover of native salt marsh vegetation; and the reduction of shoreline erosion, which would protect created salt marsh habitat.

Baseline monitoring would be conducted to collect data that would be used as points of comparison for implementation and post-implementation monitoring data. Implementation monitoring would be conducted to ensure that the breakwaters were constructed with the appropriate dimensions. In general, components of this monitoring would evaluate the production and support of organisms on the breakwater (e.g., benthic secondary productivity), the performance of the breakwater in protecting the shoreline (e.g., salt marsh habitat), and the creation of salt marsh habitat. Performance criteria would be established to determine whether the project achieves the desired breakwater specifications, benthic secondary productivity, and salt marsh habitat created.
Components of this monitoring may include collecting information with respect to:

- Structural integrity of breakwater/reef structure;
- Height/elevation and width of breakwater/reef structure;
- Consolidation rate of breakwater/reef structure;
- Shoreline (salt marsh) profile;
- Shoreline (salt marsh) position;
- Bivalve density, size, biomass, and survival;
- Non-bivalve invertebrate density and biomass; and
- Percent cover and survival of planted marsh vegetation.

Adaptive management procedures will be used to correct deficiencies or maintenance needs identified through monitoring. Furthermore, a minimum of 80 percent of the plantings must be viable at the end of the first growing season subsequent to initial planting. Viable area coverage shall be monitored in following years to ensure establishment of salt marsh vegetation. Monitoring of the plantings would occur for a minimum of 5 years with a minimum of one site inspection per year. Annual reports and photographs would be prepared during the monitoring period.

12.7.5 Affected Environment and Environmental Consequences

Under the National Environmental Policy Act, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

12.7.5.1 No action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue the this project as part of Phase III Early Restoration.

Under No Action, the existing conditions described for the project site in the affected environment subsection would prevail. Restoration benefits associated with this project would not be achieved at this time.

12.7.5.2 Physical Environment

12.7.5.2.1 Geology and Substrates

Affected Resources

The existing geology and substrates in the project area at Cat Point can be described as gently sloping sandy/silty beaches in an estuarine system, specifically the Apalachicola River and Bay Basin. The estuarine embayments are in the Gulf Coastal Lowlands subdivision. The lowlands are a series of parallel terraces rising from the coast in successively higher levels (Scott et al. 2006). They formed during the Pleistocene Epoch (Great Ice Age), when fluctuating sea levels were associated with the growth and melting of ice caps. Dunes, barrier islands, beach ridges, and other topographical features were stranded inland as seas receded. Land surfaces of the lowlands are generally level and less than 100 feet above sea level. Substantial areas are less than 30 feet above sea level and are characterized by extensive wetlands.

The Apalachicola Bay area has been sculptured from an alluvial plain underlain by sand, gravel, silt, and clay. The *Soil Survey for Franklin County* identifies the areas chosen for placement of the marsh creation and living shorelines structures as "Waters of the Gulf of Mexico" and no soils data are provided. The natural bay shoreline is fringed by wide, shallow sandflats between 3 and 5 feet deep (Williams 2004).

Environmental Consequences

The proposed project would have minor, short-term impacts to the geology and substrates along the shoreline. The existing sandy substrate would be covered with hard structure reef materials. However, the project footprint is very small and encompasses approximately 0.3 acres of area. Disturbance to geologic features or soils would be detectable, but would be small and localized. There would be no changes to local geologic features or soil characteristics.

In the long term, the net benefits of habitat protection and restoration outweigh this direct impact by increasing benthic habitat diversity and creating structural complexity that supports a greater diversity and abundance of marine aquatic species.

12.7.5.2.2 Hydrology and Water Quality

Affected Resources

Cat Point is located within the Apalachicola NERR and characterized by its good water quality conditions. Briefly, the NERR is a system of 28 sites nation-wide that are protected through partnerships with the coastal states and NOAA.

Hydrology
Apalachicola Bay is a lagoon and estuary that encompasses St. George Sound, St. Vincent Sound, and East Bay. The entire bay area encompasses approximately 200 square miles. There are several rivers that drain into the bay, and these include the Apalachicola River and Carabelle River.

Water Quality
Apalachicola Bay is mostly designated as a Class II Shellfish Harvesting Area. It has excellent water quality, and the waters of the bay are tested regularly.

Floodplains
The project is located in Federal Emergency Management Agency (FEMA)–designated flood zone according to the Flood Insurance Rate Maps (FIRMs) for Franklin County (FIRM No. 12037C0532E, Franklin County). The project is located in Zone VE, with a base flood elevation of 14 feet above mean sea level (AMSL). VE zones are coastal flood zones with velocity hazards.

Wetlands
The project would take place in open water, off an existing paved road, and on bay beach areas. There are no wetlands identified in these areas (Department of the Interior [DOI] 2013).

Environmental Consequences
The impact on hydrology would be measurable, but it would be small and localized. The footprint of the project is near to the shore and encompasses approximately 0.3 acre of land.

The impact to water quality would be short term and minor. During the construction phase of the project, it is likely that sandy soils would be disturbed as the substrate is placed in the water. This would result in a detectable change to water quality, but the change would be expected to be small and localized. Impacts would quickly become undetectable. State water quality standards as required by the CWA would not be exceeded.

The project area is classified as a high-velocity flood zone. Impacts may result in a detectable change to natural and beneficial floodplain values, but the change would be expected to be small and localized. There would be no appreciable increased risk of flood loss, including impacts on human safety, health, and welfare.

The project area is not in a wetland. However, by installing the living shoreline/breakwaters, wetlands would be created behind the breakwaters. This is a beneficial effect as it would create additional estuarine habitat that can host many species that are present in the region.

Construction activities would use best management practices (BMPs) and are anticipated to last 3 to 6 months from the time site preparation and access activities begin. The calendar year timing would depend on the timing of funding availability and the contract award along with any permit constraints required as a result of listed species considerations. BMPs may include, but would not necessarily be limited to, the following:

- Installation of floating turbidity barriers
- Installation of erosion control measures along the perimeter of all work areas
- Stabilization of all filled areas with sod, mats, barriers, or a combination
- Storing and fueling vehicles away from aquatic areas

- Re-vegetation of exposed soils when construction activities are complete

The proposed discharge of dredged or fill material into waters of the United States, including wetlands, or work affecting navigable waters associated with this project is currently being coordinated with the U.S. Army Corps of Engineers (Corps) pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). Coordination with the Corps and final authorization pursuant to CWA/RHA will be completed prior to project implementation.

12.7.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

The current air quality index in the project area is good, with respect to both National Ambient Air Quality Standards (NAAQS) and carbon dioxide (CO_2) emissions. Air quality in the Florida panhandle is in attainment with the NAAQS (Environmental Protection Agency [EPA] 2013).

The rock and shell-based materials would be placed by heavy equipment (e.g., front-end loader, crane) from shore, as the area where the materials would be placed is exposed at low tide. A vehicle would be used to transport riprap boulders and oyster shell material from staging areas near the shoreline to a location where they would be picked up by the crane, which would place the material in the intertidal areas to construct the breakwater structure(s). Some engine emissions would be generated from the vehicle and crane for 8 hours per day, 5 days per week, for up to 3 months to construct the structure and restore the shoreline including any material staging areas. Plantings for the restored/created salt marsh would be made primarily using hand tools or light equipment if minor re-grading and equipment moving/boring is needed. Table 12-1 lists the greenhouse gas emissions expected from use of mechanized equipment.

Environmental Consequences

Negative impacts to air quality would be minor because the construction phase of the living shoreline project would be short in duration and would use minimal heavy equipment. The impact on air quality may be measurable, but would be localized and temporary, such that the emissions would not exceed the EPA's de minimis criteria for a general conformity determination. The contributions to greenhouse gases may be measurable, but below 25,000 metric ton/year of CO_2 or its equivalent. Marsh plantings would have a moderate beneficial impact to air quality. Over time, the plantings would propagate and the marsh area would fill in. This would create additional land area where seagrasses and other relevant plant materials would enrich the environment.

Table 12-1. Greenhouse Gas Emissions for various mechanized equipment.

EQUIPMENT1	TOTAL HOURS USED	CO_2 FACTOR-MT/100 HRS	CO_2 (MT)[2]	CH_4 FACTOR-MT/100 HRS	CH_4 (CO_2E) (MT)[3]	N_2O FACTOR-MT/100 HRS	NOX (CO_2E) (MT)	TOTAL CO_2E (MT)
Crane	480	0.29	1.39	0.0001	0.0005	0.001	0.0048	1.39
Dump Truck	96	0.344	0.33	0.0002	0.002	0.002	0.002	0.33
Boat[4]	480	1.3	6.24	0.002	0.01	0.01	0.05	6.3
Pickup Truck[5]	180	0.16	0.29	0.0001	0.0002	0.001	0.002	0.3
TOTAL	1,236							8.32

[1] Emissions assumptions for all equipment based on 8 hours of operation

[2] CO_2 emissions assumptions for diesel and gasoline engines based on Environmental Protection Agency (EPA) 2009

[3] CH_4 and NOx emissions assumptions and CO_2e calculations based on EPA 2011

[4] Fuel economy assumptions for a 300-hp marine diesel powerboat and 1,000-hp marine diesel passenger ferry based on Becker 2013.

[5] Emissions assumptions for an 8-cylinder, 6.2-liter gasoline engine Ford F150 pickup based on Department of Energy (DOE) 2013 and 18-gallon (half-tank) daily fuel consumption.

mt = metric tons; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; NOx = nitrogen oxide/dioxide; CO_2e = carbon dioxide equivalent

12.7.5.2.4 Noise

Affected Resources

Existing ambient noise levels along the shoreline at Cat Point are generally low and predominantly result from daily boating activities in St. George Sound. Noise can be defined as unwanted sound and noise levels, and its impacts are interpreted in relation to impacts on nearby visitors to the recreational areas and wildlife in the project vicinity. The Noise Control Act of 1972 (42 USC 4901–4918) was enacted to establish noise control standards and to regulate noise emissions from commercial products such as transportation and construction equipment. The standard measurement unit of noise is the decibel (dB), which represents the acoustical energy present. Noise levels are measured in A-weighted decibels (dBA), a logarithmic scale that approaches the sensitivity of the human ear across the frequency spectrum. A 3-dB increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear. Table 12-2 shows typical noise levels for common sources expressed in dBA. Noise exposure depends on how much time an individual spends in different locations.

Noise levels in the project area vary depending on the season, time of day, number and types of noise sources, and distance from noise sources. Existing sources of noise in the project area are from vehicles, recreational boating, overhead aircraft, and ambient natural sounds such as wind, waves, and wildlife. Existing ambient noise levels in the ANERR are generally low and predominantly result from human visitation and offshore boating activities.

Table 12-2. Common noise levels.

NOISE SOURCE OR EFFECT	SOUND LEVEL (DBA)
Rock-and-roll band	110
Truck at 50 feet	80
Gas lawnmower at 100 feet	70
Normal conversation indoors	60
Moderate rainfall on foliage	50
Refrigerator	40
Bedroom at night	25

Source: Adapted from Bonneville Power Administration (BPA) 1986, 1996.

Noise-sensitive receptors include sensitive land uses and those individuals and/or wildlife that could be affected by changes in noise sources or levels due to the project. Noise-sensitive receptors in the project vicinity include Apalachicola NERR use and wildlife.

Environmental Consequences

During the construction phase of the project, increased noise from operation of the crane and other construction equipment could attract attention, but their contribution to the soundscape would be localized and not of consequence, nor would it affect current user activities. Once built, the proposed project would not cause long-term noise impacts.

12.7.5.3 Biological Environment

12.7.5.3.1 Living Coastal and Marine Resources

Vegetation

Affected Resources

The project area has both an onshore (road to access project area and staging areas on the beach) and offshore component. According to the Natural Vegetation of Florida map the project area is located on previously existing sand pine (*Pinus clausa*) scrub forest. This vegetation type is mostly on excessively drained deep sandy soils and occurs on dunes of coastal strand and old dunes or dry sands in the interior (Davis 1967). Based on aerial reviews, the project site appears to contain mainly unvegetated sandy beach areas.

Offshore, there are a variety of aquatic plants that are present in the existing marsh areas near the project area. During the original construction of the existing Cat Point Living Shoreline, several species of native saltwater plants were placed behind the living shoreline to facilitate marsh creation. These included saltgrass (*Distichlis spicata*), marsh-hay cordgrass (*Spartina patens*), railroad vine (*Ipomoea pes-caprae*), and saltmarsh cordgrass (*Spartina alterniflora*).

In addition to these plants, there are seagrasses present on the other side of the bay, approximately 5 miles from the project site (Florida Fish and Wildlife Conservation Commission [FWC] 2011). These include primarily shoal grass (*Halodule wrightii*). Seagrass communities are essential breeding, rearing, and feeding grounds for many important recreational and commercial fisheries, and wildlife including the endangered West Indian manatee (*Trichechus manatus*) and various species of sea turtles.

Environmental Consequences

The current project would include expansion of the current living shoreline, and work would take place in the water. As part of the project, the area behind the newly constructed living shoreline would be planted with several species of native saltwater plants. As the plants would be placed behind the breakwater by hand, the disturbance would be minor and localized to the areas that are being actively planted. Breakwater materials would be placed in the project area via crane or front end loader from the shore. During the creation of the original living shoreline, any exotic species were removed concurrent with planting and will be removed as part of this project.

Overall, impacts on native vegetation may be detectable, but would not alter natural conditions and would be limited to localized areas. Infrequent disturbance to individual plants could be expected, but without affecting local or range-wide population stability. Infrequent or insignificant one-time disturbance to locally suitable habitat could occur, but sufficient habitat would remain functional at both the local and regional scales to maintain the viability of the species. In the long term, the marsh plantings would likely create additional habitat for marine species and wading birds, prevent further erosion of the shoreline, improve water quality, reduce wave activity, and increase sediment deposition in the area.

The FDEP may require permits and impose reasonable conditions as necessary to ensure that the construction complies with the provisions of Chapter 62-346.050 (3) of the Florida Administrative Code (FAC), which states in part that dredging and filling in, on, or over surface waters of the state remain subject to the requirements of Chapter 62-312, FAC, including the need to obtain a separate permit under that chapter until the effective date of the rules adopted under Section 373.4145(1)(b), Florida Statutes (FS). The FDEP permit also grants state-owned submerged lands authorization from the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees) pursuant to Article X, Section 11 of the Florida Constitution, and Section 253.77, FS and Chapter 258, FS. On November 18, 2011, FDEP issued Environmental Resource Permit No. 19-0304982-001-EI to construct the existing breakwaters and created salt marsh areas as mitigation to offset wetland impacts associated with a separate project constructed by a power company. Both the project and mitigation authorized by the permit issued from FDEP (as well as USACE Permit No. SAJ-2011-00557) are complete. Mitigation monitoring of the existing created salt marsh habitat is ongoing. However, the current FDEP and USACE permits only authorized construction of the original structures. The proposed project includes extensions of the existing living reef system (breakwaters); therefore, new Clean Water Act Section 404 permits to construct the project will be required.

12.7.5.4 Wildlife Habitat

Affected Resources

The onshore portion of the project area (mainly the beach area to be used for staging) provides habitat for wildlife such as wading birds (herons and egrets), swimmers (cormorants and anhingas), brown pelicans (*Pelecanus occidentalis),* and birds of prey that feed on juvenile and adult fish. The most common resident marsh and wading birds are great blue heron (*Ardea Herodias*), little blue heron (*Egretta caerulea*), white ibis (*Eudocimus albus*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), tricolored egret (*Egretta tricolor*), yellow-crowned night heron (*Nyctanassa violacea*), and black-crowned night heron (*Nycticorax nycticorax*). Urban and open, vacant land adjacent to the project area serves as a refuge and staging area for many passerine birds during migration, and large concentrations

of shorebirds are sometimes observed feeding in the mudflats occurring in the vicinity of the project area.

Based on the types of habitat present, and because of its size, elevation, and location, it is expected that ruderal species such as raccoon, opossum, grey squirrel, and other non-game mammals be present in upland areas in the project vicinity.

Environmental Consequences

Construction activities in the terrestrial portions of the project area are limited to use of an existing, paved road and staging of equipment and materials on the beach. Terrestrial populations of animals, including small mammals and some birds, would potentially be subject to short-term, minor impacts to their habitats. The natural processes sustaining them would be detectable, but localized and would not measurably alter natural conditions. Small changes to local population numbers, population structure, and other demographic factors could occur. Sufficient habitat would remain functional at both the local and range-wide scales to maintain the viability of the species.

In the long term, the addition of the living shorelinewould provide additional feeding sources for some of the terrestrial animals as habitat for aquatic species would be expanded. The addition of the breakwaters would reduce wave velocity and decrease erosion, which may create a more stable shoreline; this would ultimately result in a protected nearshore environment for the species that live there.

12.7.5.5 Marine and Estuarine Fauna (fish, shell beds, benthic organisms)

Affected Resources

The project area provides habitat for numerous fish and other marine species. The value of marine habitats at the project site has been affected by population growth, development, and wastewater disposal. Increased coastal development, in particular, has contributed to displaced habitats, loss of wetlands, and greater amounts of stormwater runoff entering the bay and its tributaries (Northwest Florida Water Management District [NWFWMD] 2011). Nonetheless, the marine environment at the project site provides habitat to an array of aquatic species including ladyfish (*Elops saurus*), hardhead catfish (*Arius felis*), gafftopsail catfish (*Bagre marinus*), and pigfish (*Orthopristis chrysoptera*), among others. Benthic organisms such as bivalves, gastropods and other mollusks, anemones, amphipods, annelids, crustaceans, and echinoderms are also abundant in these waters.

Environmental Consequences

The proposed project would likely result in short-term, minor adverse impacts due to construction of the breakwater structures in shallow, intertidal habitat that may harbor invertebrates or sessile organisms. Small fish that frequent the intertidal area within the construction envelope are highly mobile and would be displaced to suitable habitat in the restoration area. However, these species are typically numerous in the area and recolonize quickly. The proposed breakwaters would benefit the fish and invertebrate community by providing additional structures that attract prey. Impacts would be detectable and localized but small. Disturbance of individual species would occur; however, there would be no change in the diversity or local populations of marine and estuarine species. Any disturbance would not interfere with key behaviors such feeding and spawning. There would be no restriction of movements daily or seasonally.

The proposed project would provide long-term benefits to marine species providing additional fish habitat, increased benthic productivity, and enhanced recruitment and production of fish and invertebrates. The proposed breakwaters and restoration of the salt marsh communities would benefit numerous aquatic species such as blue crab (*Callinectes sapidus*), bivalves (*oysters*) and gastropods (*Gastropoda sp.),* red drum (*Sciaenops ocellatus*), and speckled sea trout (*Cynoscion nebulosus).* Over the life of the project, the quality of fish habitat would increase, and the stabilization of shoreline community would allow it to become more productive. The greater overall beneficial impact resulting from the restored habitat would outweigh potential short-term impacts to these species. Therefore, short- and long-term impacts to marine and estuarine fauna are expected to be minor as a result of project construction.

12.7.5.6 Protected Species

Affected Resources

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

The Trustees have reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS. For this, the Trusteesfirst reviewed the species list for Franklin County, Florida[1]. Table 12-3 presents a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

Table 12-3. Potential Impacts to Species/Critical Habitats managed by USFWS

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle[a], Hawksbill turtle[a], Kemp's ridley turtle; Leatherback turtle[a], Loggerhead turtle	The main risk to sea turtles during execution of this project would come from collisions during the placement of the breakwater materials, which could result in harm or mortality. Consultation has been completed with NMFS, the agency that has jurisdiction to review impacts to sea turtles in the estuarine and marine environments. The planting activity associated with the restoration of the salt marsh habitat should not pose a risk given the limited extent of the acreage involved and the fact that the project is on the shore side of Apalachicola Bay in an area that is is not turtle nesting habitat. No nesting habitat is present on the adjacent shoreline; therefore no effect to sea turtles in terrestrial habitats are anticipated. No designated or proposed critical habitat for sea turtles occurs within the action area: therefore, none will be adversely modified or destroyed.

[1] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
West Indian manatee	Franklin county is not one of the 36 Florida counties that are identified as being counties where manatees regularly occur in coastal and inland waters (U.S. Department of the Interior, 2011). However, manatees could be present in the project waters. The main risk to manatees during implementation of this project would come from collisions with equipment used to place the breakwater materials or the materials themselves which could result in harm or mortality. Implementation of the conservation measures is expected to minimize the risk of collision of project debris and vessels such that it is insignificant and discountable.
Piping plover	The main risk to Piping plovers is from human disturbance while resting and foraging in habitats adjacent to work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the plovers to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable Piping plover critical habitat is not designated in or near the project area.
Red knot	The main risk to Red knots is from human disturbance while resting and foraging in habitats adjacent to work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the red knots to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable.
Gulf sturgeon	NMFS was consulted on Gulf sturgeon and its Critical Habitat in the estuarine environment. As a result, Gulf Sturgeon was not considered in the consultation with the USFWS.

In addition to the protected species managed by USFWS, the Trusteesreviewed the proposed projects and associated actions for potential impacts to the following protected species (status indicated) and their associated critical habitat, if appropriate, managed by NMFS:

- Gulf Sturgeon, *Acipenser oxyrinchus desotoi*, Threatened
- Smalltooth Sawfish, *Pristis pectinata,* Endangered
- Green Sea Turtle, *Chelonia mydas*, Endangered
- Loggerhead Sea Turtle, *Caretta caretta*, Threatened
- Hawksbill Sea Turtle, *Eretmochelys imbricata*, Endangered
- Leatherback Sea Turtle, *Dermochelys coriacea*, Endangered
- Kemp's Ridley Sea Turtle, *Lepidochelys kempii*, Endangered

Additional information for some of thes species is provided below.

Sea Turtles and Marine Mammals

There are five species of endangered or threatened sea turtles that may occur or have the potential to occur in the project area. These include green turtle, hawksbill turtle, Kemp's ridley turtle, leatherback turtle, and loggerhead turtle. Sea turtles forage in the waters of the coastal Florida panhandle region and have the potential to occur in the waters where in-water work is proposed. The project site contains potentially suitable sea turtle nesting habitat along the sandy beach, but the site is on the bay side where nesting is uncommon.

Twenty-two marine mammals are native to the Gulf of Mexico: 21 pelagic species of whales and dolphins, and the West Indian manatee (see Chapter 3). Of these species, the endangered West Indian manatee has the potential to occur in the project area waters. Manatees typically seek out shallow seagrass areas as preferred feeding habitat. Additionally, bottlenose dolphin (*Tursiops truncatus*)

populations are known to migrate into bays, estuaries, and river mouths and could be located in the proposed project area (NMFS 2013a). Bottlenose dolphins have been observed entering and leaving nearshore coastal waters (NMFS 2012).

Smalltooth Sawfish and Gulf Sturgeon

Smalltooth sawfish (*Pristis pectinata)* do not typically use northern Gulf of Mexico waters (NMFS 2013b). Gulf sturgeon are restricted to the Gulf of Mexico and its drainages, occurring primarily from the Pearl River in Louisiana to the Suwannee River, in Florida (NMFS 2009). Adult fish reside in rivers for 8 to 9 months each year and in estuarine or Gulf of Mexico waters during the 3 to 4 cooler months of each year (NMFS 2009). Important marine habitats include seagrass beds with sand and mud substrates (Mason and Clugston 1993).

Gulf sturgeon critical habitat was jointly designated by the NMFS and USFWS on April 18, 2003 (50 C.F.R. 226.214). The proposed project site is located within the Florida Nearshore Gulf of Mexico Critical Habitat Unit 11, which contains winter feeding and migration habitat for Gulf sturgeon. Critical habitat was designated based on seven primary constituent elements (PCEs) essential for its conservation, as defined in the 2003 *Federal Register*.

These seven elements are listed below. PCEs present at the project site include elements applicable to esturine and marine habitats (i.e., elements 1, 5, 6, and 7).

1. Abundant food items, such as detritus, aquatic insects, worms, and/or mollusks, within riverine habitats for larval and juvenile life stages; and abundant prey items, such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks, and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages;
2. Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
3. Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths; these are believed necessary for minimizing energy expenditure during freshwater residency and possibly for osmoregulatory functions;
4. A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging;
5. Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages;
6. Sediment quality, including texture and chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and
7. Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., an unobstructed river or a dammed river that still allows for passage) (see Figure 12-5 for Gulf sturgeon critical habitat near the project area).

Figure 12-5. Critical habitat for Gulf sturgeon near the Cat Point Living Shoreline project area.

Piping Plover

The sandy beaches and shorelines adjacent to the project area offer suitable foraging and resting habitat for the piping plover during the winter migratory season, and piping plover may forage in the shallow waters of the project area. Natural shorelines in the proposed project vicinity provide suitable winter migration resting habitat for the piping plover. Piping plover wintering habitat includes beaches, mudflats, and sandflats, as well as barrier island beaches and spoil islands (Haig 1992 as cited by USFWS 2013). On the Gulf Coast, preferred foraging areas are associated with wider beaches, mudflats, and small inlets (USFWS 2013).

Red Knot

The red knot, a proposed species for listing under the ESA, uses the state of Florida both for wintering habitat and migration stopover habitat for those that continue to migrate to specific wintering locations in South America (Niles et al. 2008) and could be present at the project site. Wintering and migrating red knots forage along sandy beaches, tidal mudflats, salt marshes, and peat banks (Harrington 2001). Observations indicate that red knots also forage on oyster reef and exposed bay bottoms, and roost on high sandflats, reefs, and other sites protected from high tides (Niles et al. 2008). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Threats to wintering and stopover habitat in Florida include shoreline development, hardening, dredging, deposition, and beach raking (Niles et al. 2008).

Essential Fish Habitat

EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. The EFH within the project area include emergent wetlands, mud substrate, and estuarine water columns for species of fish, such as red drum, brown shrimp, pink shrimp, and white shrimp. There are no marine components of EFH in the vicinity of the project site.

Table 12-4 provides a list of the species that NMFS manages under the federally Implemented Fishery Management Plan in the vicinity of the Cat Point Living Shoreline project site which is located along the northwestern portion of St. George Sound within the Apalachicola National Estuarine Research Reserve (ANERR).

Table 12-4. Federally managed fisheries with designated Essential Fish Habitat (EFH) in the proposed project area.

EFH Category	Species
Atlantic Highly Migratory Species	Atlantic Sharpnose Shark Adult
	Atlantic Sharpnose Shark Juvenile
	Atlantic Sharpnose Shark Neonate
	Blacknose Shark Adult
	Blacknose Shark Juvenile
	Blacknose Shark Neonate
	Blacktip Shark Adult
	Blacktip Shark Juvenile
	Blacktip Shark Neonate

EFH Category	Species
	Bonnethead Shark Adult
	Bonnethead Shark Juvenile
	Bonnethead Shark Neonate
	Bull Shark Juvenile
	Finetooth Shark Adult and Juvenile
	Great Hammerhead Shark All
	Nurse Shark Juvenile
	Scalloped Hammerhead Shark Juvenile
	Scalloped Hammerhead Shark Neonate
	Spinner Shark Juvenile
	Spinner Shark Neonate
Coastal Migratory Pelagics of the Gulf of Mexico AND South Atlantic	Cobia
	King Mackerel
	Spanish Mackerel
Gulf of Mexico Red Drum	Red Drum
Gulf of Mexico Shrimp	Brown Shrimp
	Pink Shrimp
	White Shrimp
Reef Fish Resources of the Gulf of Mexico	Almaco Jack
	Banded Rudderfish
	Black Grouper
	Blackfin Snapper
	Blueline Tilefish
	Cubera Snapper
	Gag
	Goldface Tilefish
	Gray (Mangrove) Snapper
	Gray Triggerfish
	Greater Amberjack
	Hogfish
	Lane Snapper
	Lesser Amberjack
	Mutton Snapper
	Nassau Grouper
	Queen Snapper
	Red Grouper
	Red Snapper
	Scamp
	Silk Snapper
	Snowy Grouper
	Speckled Hind
	Tilefish
	Vermilion Snapper
	Warsaw Grouper
	Wenchman
	Yellowedge Grouper
	Yellowfin Grouper
	Yellowmouth Grouper

State-Listed Birds, MBTA and BGEPA

There are numerous state of Florida–listed bird species with potential for occurrence in and around the Cat Point Living Shoreline project site. These include Arctic peregrine falcon (*Falco peregrinus tundrius*), least tern (*Sterna antillarum*), southeastern American kestrel (*Falco sparverius paulus*), Florida sandhill crane (*Grus canadensis pratensis*), American oystercatcher (*Haematopus palliates*), and southeastern/Cuban snowy plover (*Charadrius alexandrinus tenuirostris*).

The proposed project site is located across the bay from the St. George Island Causeway, more than 1 mile away. This causeway island, approximately 1.3 miles long and 50 yards wide, is one of the most important nesting sites in the panhandle for terns, skimmers, oystercatchers, and laughing gulls. Documented nesting species include least tern, gull-billed tern, caspian tern, royal tern, sandwich tern, sooty tern (one pair in 2007 and 2008), black skimmer, and American oystercatcher (Audubon 2012). Many of the species that could be in the vicinity of the project site are also state listed. St. George Sound provides important foraging habitat for many MBTA birds and raptors that may be present during the nesting season or may use the area as overwintering habitat.

Bald eagles are known to nest within 1 mile of the project site (FDEP, personal communication, September 26, 2013). The bald eagle was delisted by the USFWS and is not listed as threatened or endangered by the FWC. The bald eagle is, however, protected by state law pursuant to 68A-16, Fla. Admin. Code and by the U.S. government under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles feed on fish and other readily available mammalian and avian species and are dependent on large, open expanses of water for foraging habitat. In Florida, conservation measures to protect active nest sites during nesting season must be considered to reduce potential disturbances of certain project activities. If bald eagles are found nesting within 660 feet of a proposed construction area, then activities would need to occur outside of nesting season or coordination with the USFWS would occur to determine if a permit is needed, and Florida's *Bald Eagle Management Plan* guidelines would be followed (FWC 2008).

The proposed project was also reviewed for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), respectively. Table 12-5 provides a summary of the different migratory bird groups specifically addressed by this review and summarizes the potential impacts to these groups and associated habitats that could result from the implementation of this project.

Table 12-5. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Shorebirds and oystercatchers	Foraging, feeding, resting, nesting	Shorebirds nest, forage, feed, and rest, and in the types of habitats consistent with some of the shoreline areas near proposed actions. As such, foraging, feeding, and resting may be impacted locally and temporarily by the project. NO nesting habitat is known in the project area; however, if nesting birds (adults, eggs, chicks) are present, impacts will be avoided.
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Resting, roosting, nesting	Seabirds forage in water and rest/roost in terrestrial habitats. However, the level of project activity in open water could startle foraging or resting birds. Because activities will occur during the day roosting should not be impacted. Nesting is not known in the action area.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in Table 12-6.

Table 12-6. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Shorebirds and oystercatchers	The Trusteesexpect foraging and resting birds would be able to move to another nearby location to continue foraging and resting. If construction and planting occurs during shorebird nesting season (February 15 to August 31), the FWC will be contacted to obtain the most recent guidance to protect nesting shorebirds or rookeries and their recommendations will be implemented.
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care will be taken to minimize noise and physical disruptions near areas where foraging or resting birds are encountered. All disturbances will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity, which they will have. Roosting should not be impacted because the project will occur during daylight hours only. Nesting should not be impacted because the project will not occur near nesting habitats.

Environmental Consequences

Protected Species

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On March 20, 2014 the review of potential impacts to species managed by USFWS was completed (McClain, 2014).The USFWS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect West Indian manatee, piping plover, and red knot (if listed). This review also concurred with the Trustees'conclusion the project would have no effect on five species of sea turtles in terrestrial habitats (green, hawksbill, Kemp's ridley, leatherback, and loggerhead).

NMFS also reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On April 11, 2014 the review of potential impacts to species managed by NMFS was completed. NMFS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect Kemp's ridley, leatherback, and loggerhead sea turtles in marine habitats (Croom, 2014). This review also concluded hawksbill and leatherback sea turtles will not be present, thus, they will not be affected. Similarly, the NMFS review concurred that Smalltooth sawfish are unlikely to be encountered and therefore will not be affected (Croom, 2014).

The Trustees also evaluated the potential for take of Marine Mammals under the MMPA and due to these species' mobility and the implementation of NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006), NMFS' *Measures for Reducing Entrapment Risk to Protected Species* (NMFS,2012), *Standard Manatee Conditions for In-Water Work* (USFWS 2011), and USFWS recommended conservation measures for listed species and other trust resources, take of marine mammals under the MMPA is not anticipated.

Essential Fish Habitat

On March 5, 2014 NMFS completed its evaluation of potential EFH impacts and concurred with the Trustees' assessment that the project is not likely to adversely affect EFH (Fay, 2014). The project would not result in adverse, direct impacts to emergent wetlands, existing oyster reefs, or Submerged Aquatic

Vegetation (SAV). Most motile fauna such as crab, shrimp, and finfish will likely avoid the area of potential effect during the construction process. The project may result in minor, adverse short term impacts to benthic organisms and temporarily affect habitat utilization by individuals considered under EFH fishery management plans.

The proposed work in the EFH area reflects the expansion of an existing breakwater through the installation of approximately 0.3 linear feet of new breakwater. Additionally, approximately 1 acre of salt marsh habitat, anticipated to be protected by the breakwater, would be planted. Installation of the breakwaters and planting native salt marsh vegetation may result in a small area of existing habitat being converted from one EFH habitat to another type; however, both habitat changes will be small and are anticipated to have a net beneficial impact to habitat quality and species found in the area. As a result, disturbance to species will be limited in their spatial extent, minor in scope, and brief in duration. Construction activities may have a minor, short term impact on habitat. During construction, all appropriate BMPs will be followed to minimize the potential impacts of construction activities on EFH and species in the area. During construction, adjacent areas with equivalent or better habitat will be available and undisturbed and organisms could move away from disturbed areas

State-listed Birds, MBTA, BGEPA

There is a known bald eagle nest within 1 mile of the project site but greater than 660 feet from project activities. Based on the distance from proposed project activities, nesting of the known occurrences of bald eagle would not be impacted. However, if a bald eagle nest were observed in the vicinity of the project site, conservation measures to protect bald eagles will be implemented (see Chapter 6 for specific measures).

Consultation with FWC concerning the proposed project and anticipated construction schedule relative to known bald eagle nest sites in the project vicinity and the nesting season in Florida (October 1 to May 15) would be required prior to commencement of activities. To minimize potential for impacts to nesting bald eagles, the consultation protection measures may include 1) addressing prescribed nest tree protection zones, and 2) preparation of a bald eagle nest protection plan (including nesting behavior disturbance monitoring). Bald eagles have been known to tolerate certain potential disturbances in their breeding territories. Should these conservation measures be implemented for active nest sites adjacent to enhancement activities in the project area, potential impacts to the bald eagle would be short term and minor.

At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

Invasive Species

Affected Resources

Non-native invasive species could alter the existing terrestrial or aquatic ecosystem within the project area, and possibly expand out into adjacent areas after the initial introduction. The invasive species threat, once realized, could result in economic damages. Prevention is ecologically responsible and economically sound. Chapter 7 addresses invasive species, pathways, impacts, and prevention. At this time specific invasive species that may be present on the project site or could be introduced through the project have not yet been identified.

Environmental Consequences

Best Management Practices (BMPs) to control the spread of any invasive species present, and prevent the introduction of new invasive species due to the project will be implemented. In general, best management practices would primarily address risk associated with vectors (e.g., construction equipment, personal protective equipment, delivery services, foot traffic, vehicles/ vessels, shipping material). There are many resources that provide procedures for disinfection, pest-free storage, monitoring methods, evaluation techniques, and general guidelines for integrated pest management that can be prescribed based upon specific site conditions and vectors anticipated. In addition, to best management practices, outreach and educational materials may be provided to project workers and potential users/visitors. Other measures that could be implemented are identified in the Chapter 6 Appendix. Due to the implementation of BMPs, the Trusteesexpect impacts due to invasive species introduction and spread to be short term and minor.

12.7.5.7 Human Uses and Socioeconomics

12.7.5.7.1 Socioeconomics and Environmental Justice

Affected Resources

The population of Franklin County is approximately 11,686. The following table shows population data for Franklin County and Florida (Table 12-7).

Table 12-7. Census data for Franklin County and the State of Florida.

PEOPLE QUICKFACTS	FRANKLIN COUNTY	FLORIDA
Population, 2012 estimate	11,686	19,317,568
Population, 2010 (April 1) estimate base	11,549	18,802,690
Population, percent change, April 1, 2010, to July 1, 2012	1.2%	2.7%
Population, 2010	11,549	18,801,310
Persons under 5 years, percent, 2012	4.6%	5.5%
Persons under 18 years, percent, 2012	16.5%	20.7%
Persons 65 years and over, percent, 2012	18.9%	18.2%
Female persons, percent, 2012	42.4%	51.1%

Source: U.S. Census Bureau 2013.

Environmental Consequences

This project would have a short-term, minor impact to the local population through disruption of localized fishing, use of the public road, and use of the public beach during construction. Limiting access to the road and beach in that location may prevent people from visiting the area during the construction period; this may have a small effect on local retail sales (food, gasoline, or similar items). A few individuals, groups, businesses, properties, or institutions would be impacted. Impacts would be short term, small and localized. These impacts are not expected to substantively alter social and/or economic conditions. Actions would not disproportionately adversely impact minority populations and low-income populations.

Direct, short-term, moderate benefits through local job creation would result from construction activities. Long-term, indirect, moderate benefits would result from increasing recreational and fishing value of the area. Greater fishing success may increase the number of fishing trips in the area, which could generate ancillary purchases such as license fees, fuel, equipment, or other ancillary purchases.

This project is not designed to create a benefit for any group or individual, but rather would provide benefits on a local and regional basis. Because the project occurs in an area that is not disproportionately minority or low income (seeTable 12-7), there are no indications that the proposed living shoreline project would be contrary to the goals of Executive Order 12898 or would create disproportionate adverse human health or environmental impacts on minority or low-income populations of the surrounding community.

12.7.5.7.2 Cultural Resources

Affected Resources

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Environmental Consequences

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

12.7.5.7.3 Infrastructure

Affected Resources

The landward side of the proposed project area is developed with a variety of infrastructure that includes shoreline protection, roads, parks, and residential development. The breakwater/living shoreline creation would take place in nearshore, open-water habitats. The breakwater and associated marshlands are well away from existing infrastructure.

Environmental Consequences

As Millender Street would be used to access the site area during the construction phase of the project, there may be a minor, short-term, temporary increase in traffic and slow-moving construction equipment in this transportation corridor. The action would affect public services or utilities but the impact would be localized and within operational capacities. Once construction is complete, there would be no effect to infrastructure.

12.7.5.7.4 Land and Marine Management

Affected Resources

The landward side of the proposed project has a variety of land uses that include recreational, commercial, and residential land uses as well as publicly owned lands. The lands in the immediate vicinity of the project area include a public park, public beach area and a previously constructed living shoreline. The current project would build on this existing project.

The project area would be located in a coastal area that is regulated by the federal CZMA of 1972 and the Florida Coastal Management Act of 1978.

Environmental Consequences

Although the action would require several permits for the short-term construction period, it would not require a variance, zoning change, or amendment to a land-use area or comprehensive management plan. The long-term impact of the project would be minor because it would not affect overall use and management beyond the project area. It would be consistent with current land use.

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS (Federal Trustees 2013). The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process (Milligan 2014).

12.7.5.7.5 Aesthetics and Visual Resources

Affected Resources

The landward side of the proposed project has a variety of land uses that provide access for residents, visitors, and commuters. The breakwater would be constructed in an area characterized as open water.

Environmental Consequences

Aesthetics would be reduced in the project area during construction due to the physical presence of the equipment used to transport the material and the presence of other land-based support equipment. There would be a change in the viewshed that would be readily apparent but would not attract attention, dominate the view, or detract from current user activities or experiences. The current aesthetic is consistent with a beach environment (including sand and water).

After the construction event, the view of the environment would still include a sandy beach and bay area, along with additional marshlands. The living shoreline would likely be just above or below the water line pending on the tides. This should not alter the view from the beach.

12.7.5.7.6 Tourism and Recreational Use

Affected Resources

Access to the project area would be via Millender Street, which is a public road. The equipment and materials would be staged on the state-owned public park area on either side of Millender Road. Recreational activities that take place on or along the beach may include but are not limited to fishing, swimming, sunbathing, and exercising.

Environmental Consequences

For a short time, the construction process would limit recreational activities, especially near the construction areas. The impact would be minor, it would be detectable and/or would only affect some recreationalists. Users would likely be aware of the action but changes in use would be slight. There would be partial closures to protect public safety. Impacts would be local.

Once completed, the project would result in a neutral impact by providing greater recreational uses for the project area, more protections from wave action by the living shoreline structure, and improved wildlife habitat.

12.7.5.7.7 Public Health and Safety and Shoreline Protection

Affected Resources

The management of hazardous materials is regulated under various federal and state environmental and transportation laws and regulations, including the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Emergency Planning and Community Right-to-Know Act; and the Hazardous Materials Transportation Act. The purpose of the regulatory requirements set forth under these laws is to ensure the protection of human health and the environment through proper management (identification, use, storage, treatment, transport, and disposal) of these materials. Some of these laws provide for the investigation and cleanup of sites that have already been contaminated by releases of hazardous materials, wastes, or substances.

Environmental Consequences

Project construction would require mechanical equipment that uses oil, lubricants, and fuels. The contractor would be required to take appropriate actions to prevent, minimize, and control the spill of construction-related hazardous materials such as vehicle fuels, oil, hydraulic fluid, and other vehicle maintenance fluids, and to avoid releases and spills. If a release should occur, it would be contained and cleaned up promptly in accordance with all applicable regulations, and the incident would be reported to appropriate agencies. As a result, no impacts associated with construction-related hazardous materials would be anticipated. The period of time during which a release could occur from construction activities would be short, and any release would be expected to be minor.

12.7.6 Summary and Next Steps

The proposed Florida Cat Point Living Shoreline Project is intended to employ living shoreline techniques that utilize natural and/or artificial breakwater material to reduce shoreline erosion and provide habitat off EastPoint, Florida. Combining these objectives, this project would create reefs to reduce wave energy, increase benthic secondary productivity, and create salt marsh habitat. Proposed activities include expanding an existing breakwater creating up to 0.3 miles of new breakwater and create 1 acre of salt marsh habitat. The project is consistent with the selected alternative in the Final Phase III

ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would provide long-term benefits by creation of approximately 1 acre of salt marsh, and approximately 0.3 miles of living shoreline. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

12.7.7 References

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12.8 Florida Pensacola Bay Living Shoreline Project: Project Description

12.8.1 Project Summary

The proposed Pensacola Bay Living Shorelines project is intended to employ living shoreline techniques that utilize natural and/or artificial breakwater material to reduce shoreline erosion and provide habitat at two sites within a portion of Pensacola Bay. This project would create reefs to reduce wave energy, increase benthic secondary productivity, and create salt marsh habitat. Proposed activities include constructing breakwaters that will provide reef habitat and creating salt marsh habitat at both sites. In total, approximately 18.8 acres of salt marsh habitat and 4 acres of reefs would be created. The estimated cost for this project is $10,828,063.

12.8.2 Introduction and Background

The proposed Pensacola Bay Living Shoreline project is located in Escambia County along an urban shoreline of Pensacola Bay that has been the location of previous successful living shoreline projects. This project proposes to implement living shoreline techniques at two neighboring sites, Project GreenShores Site II (PGS II) and Sanders Beach (see Figure 12-6 for general location and Figure 12-7 for additional detail). PGS II is located immediately west of Muscogee Wharf and would build off work completed as part of a previous Project GreenShores effort. The Sanders Beach site is 3 miles to the west, near the mouth of Bayou Chico. The project design for the Sanders Beach site is in the initial planning phase but the intention is to expand on the Project GreenShores effort by implementing similar restoration techniques.

Combining the objectives of reducing shoreline erosion and providing habitat, this project would create reefs to reduce wave energy, increase benthic secondary productivity, and create salt marsh habitat. Reefs would be created by placing a total of approximately one mile of breakwaters, linear structures that may utilize artificial and/or shell-based materials. The breakwaters would have variable crest widths (30-80 ft) based on desired wave reduction and a height that falls within the mean high and low water lines (intertidal) of the site. The specific breakwater elevation and design would be selected to maximize protection of salt marsh habitat created, meet state regulatory requirements, and avoid or minimize conflicts with current uses at the proposed sites.

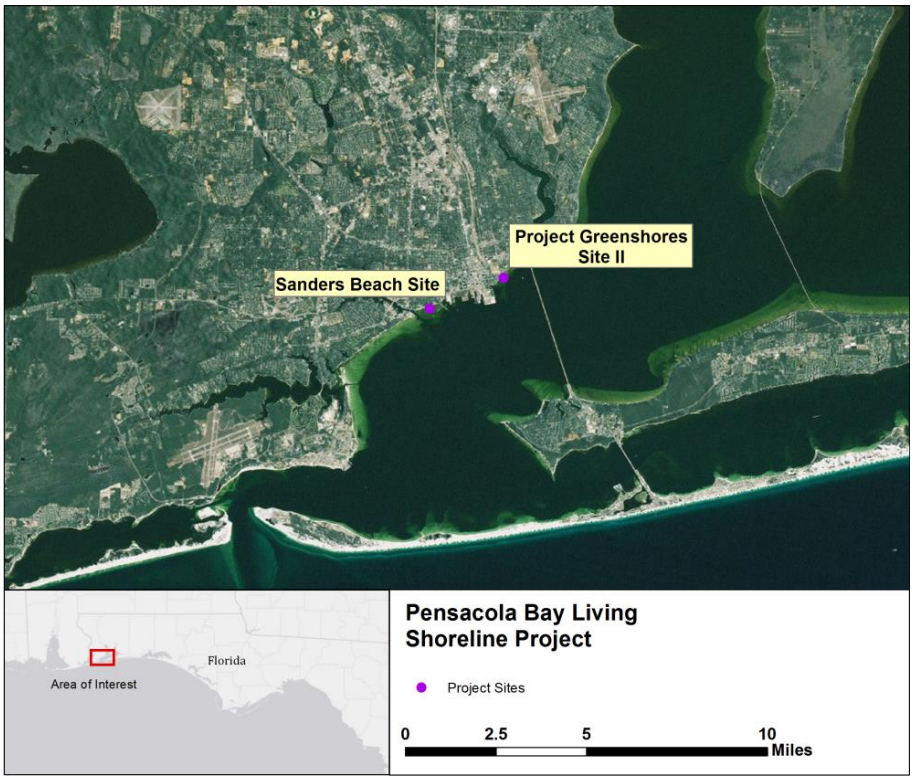

Figure 12-6. General location of proposed Pensacola Bay Living Shoreline Project.

Figure 12-7. Location of proposed PGS Site II and Sanders Beach Sites.

12.8.3 Evaluation Criteria

This proposed project meets the evaluation criteria established under OPA and the Framework Agreement. As a result of the *Deepwater Horizon* oil spill and associated response activities, benthic secondary productivity and salt marsh habitats along Florida's Panhandle suffered adverse impacts. This project seeks to foster reef and salt marsh habitat development, which would help compensate the public for Spill-related injuries and losses to benthic secondary productivity and salt marsh habitat. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

The project is technically feasible and utilizes proven techniques with established methods and documented results. Several studies of living shoreline techniques have found that these projects can successfully reduce shoreline erosion while providing habitat and water quality benefits (LaPeyre, et al. 2013[2], Scyphers et al. 2011[3], Berman et al. 2007[4]). Similar projects have also been successfully implemented in Florida, including Project GreenShores efforts in Pensacola Bay. Project GreenShores, a multi-partner, phased effort led by FDEP, included multi-million dollar habitat restoration and creation projects along the urban shoreline of Pensacola Bay. The first phase of Project GreenShores was completed in 2003 and received several awards including the 2003 Coastal America Partnership Award, the 2004 EPA Gulf of Mexico Program's Gulf Guardian Award and The Conservation Award from the Francis M. Weston Audubon Society in 2007. Over time the living shorelines techniques implemented at the Project GreenShores sites have resulted in 50-90% oyster coverage of breakwater structures, over 60 species of birds (migratory and resident populations) observed using created habitats, and species such as grey snapper, sheepshead, redfish, mullet, flounder, speckled trout, blue crab, and stone crab identified during aquatic surveys (FDEP 2012[5]). For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement.

Furthermore, the cost estimates are based on similar past projects and therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.8, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.8 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). Finally, this proposed

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[2] La Peyre, M.K., Schwarting, Lindsay, and Miller, Shea, 2013, Preliminary assessment of bioengineered fringing shoreline reefs in Grand Isle and Breton Sound, Louisiana: U.S. Geological Survey Open-File Report 2013–1040, 34 p.

[3] Scyphers SB, Powers SP, Heck KL Jr, Byron D (2011) Oyster Reefs as Natural Breakwaters Mitigate Shoreline Loss and Facilitate Fisheries. PLoS ONE 6(8): e22396. doi:10.1371/journal.pone.0022396.

[4] Berman, Marcia, Harry Berquist, Julie Herman, Karinna Nunez, 2007. The Stability of Living Shorelines – An Evaluation: Final Report submitted to NOAA Chesapeake Bay Program Office under grant number NA04NMF4570358.

[5] Florida Department of Environmental Protection (FDEP) 2012. Project GreenShores Overview Fact Sheet, http://www.dep.state.fl.us/northwest/Ecosys/section/ProjectGreenShores_%20factsheet_011112.pdf. Accessed September 30, 2013.

project is part of restoration plans put forward by Florida state agencies as funding priorities, and is therefore consistent with the long term restoration needs of the State of Florida. See Section 6d of the Framework Agreement.

Many ecological projects, including ones similar to this project, were submitted as a restoration project on the Gulf Spill Restoration website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Pensacola Bay Living Shoreline Project meets Florida's criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by the Spill.

12.8.4 Performance Criteria, Monitoring and Maintenance

As part of the project costs, monitoring would be conducted to ensure project designs were correctly implemented and to evaluate project effectiveness. Performance criteria would be used to determine project success or the need for corrective actions. The monitoring would be designed around the following project objectives: 1) protect created marsh habitat from erosion, and 2) promote reef development for bivalves and other invertebrates. Monitoring activities would be planned for up to a 7 year period and are estimated to cost approximately $669,723. Specific success criteria include: 1) the construction of reefs that meet project design criteria, support benthic secondary productivity, reduce wave energy affecting the shoreline, and are sustained for the expected life of the project; 2) the creation of salt marsh habitat that meets project design criteria and achieves the designed percent cover by native saltmarsh vegetation; and 3) the reduction of shoreline erosion which protects created salt marsh habitat.

Baseline monitoring would be conducted to collect data that will be used as a point of comparison for implementation and post implementation monitoring data. Performance criteria would be established to determine whether the project achieves the desired breakwater specifications, benthic secondary productivity, and salt marsh habitat created. Components of this monitoring may include collecting information with respect to:

- Structural integrity of breakwater/reef structure;
- Height/elevation and width of breakwater/reef structure;
- Consolidation rate of breakwater/reef structure;
- Shoreline (salt marsh) profile;
- Shoreline (salt marsh) position;
- Wave energy;
- Bivalve density, size, biomass, and survival;
- Non-bivalve invertebrate density and biomass; and
- Percent cover and survival of planted marsh vegetation.

Adaptive management procedures will be used to correct deficiencies or maintenance needs identified through monitoring. Adaptive management activities may include adding additional material to the surface of a breakwater, adding additional hardened structure (e.g. riprap), adding additional natural materials (e.g. fossilized oyster shell), and/or replacing warning signs. Furthermore, a minimum of 80 percent of the plantings must be viable at the end of the first growing season subsequent to initial planting. Viable area coverage shall be monitored in following years to ensure establishment of salt

marsh habitat. All monitoring and adaptive management procedures would follow disturbance minimization measures, especially as they relate to vessel use around the project area.

12.8.5 Offsets

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Resource Equivalency Analysis and Habitat Equivalency Analysis to estimate appropriate biological and habitat Offsets for the Pensacola Bay Living Shoreline Project. Habitat Offsets (expressed in DSAYs) were estimated for salt marsh habitat created by this proposed project based on the expected spatial extent and duration of improvements attributable to the project. In estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, new marsh created by the project, the time period it would take for created marsh to provide different levels of ecological benefits, the time period over which the project would continue to provide benefits, and the ecological benefits of created marsh relative to existing marsh habitats that were not affected by the Spill. The Trustees and BP agreed that if this Early Restoration project is selected for implementation, BP would receive Offsets of 86.63 DSAYs of Salt Marsh Habitat in Florida, applicable to Salt Marsh Habitat injuries in Florida, as determined by the Trustees' total assessment of injury for the Spill.

Benthic Secondary Productivity Offsets (expressed in DKg-Ys) were estimated for expected increases in invertebrate infaunal and epifaunal biomass attributable to the project. In estimating DKg-Ys, the Trustees considered a number of factors, including, but not necessarily limited to, typical productivity in the project area, estimated project lifespan and project size. The Trustees and BP agreed that if this Early Restoration project is selected for implementation, BP would receive Offsets of 28,813 DKg-Ys of benthic secondary productivity, applicable to benthic Secondary Productivity injuries in Florida, as determined by the Trustees' total assessment of injury for the Spill. If these benthic Secondary Productivity Offsets exceed the specified injury, the Trustees and BP will apply "excess" Offsets for benthic Secondary Productivity within Federal waters on the Continental Shelf, excluding those associated with mesophotic reefs. These Offsets would not apply to injuries in Alabama, Mississippi, Louisiana or Texas. These Offset types and amounts are reasonable for this project.

12.8.6 Cost

The total estimated cost to implement this project is $10,828,063. This cost reflects cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and potential contingencies.

12.9 Florida Pensacola Bay Living Shoreline Project: Environmental Review

The National Oceanic and Atmospheric Administration (NOAA) and the Florida Department of Environmental Protection (FDEP) propose to employ living shoreline techniques, which utilize natural and artificial breakwater materials, to stabilize shorelines by dampening wave energy while also increasing benthic secondary productivity and providing salt marsh habitat that was once abundant in the region. The restoration goals of this project are to construct breakwaters to create approximately 4 acres of reef habitat and 18.8 acres of salt marsh habitat.

The proposed living shoreline project is located in Escambia County along an urban shoreline of Pensacola Bay that has been the location of previous successful living shoreline projects. This project proposes to implement living shoreline techniques at two neighboring sites, Project GreenShores Site II (PGS II) and Sanders Beach (see Figure 12-8 for general location and Figure 12-9 for additional detail). PGS II is located immediately west of Muscogee Wharf and would complete and expand the construction of a third breakwater at this site, building off work completed as part of a previous Project GreenShores effort. The Sanders Beach site is three miles to the west, near the mouth of Bayou Chico. The project design for the Sanders Beach site is in the initial planning phase but the intention is to expand on the Project GreenShores effort by implementing similar design and restoration techniques at this site. Combining the objectives of shoreline stabilization and providing habitat, this project would construct breakwaters to reduce wave energy, increase benthic secondary productivity, and create salt marsh habitat.

12.9.1 Introduction and Background

In April 2011, the Trustees and BP entered into the Framework Agreement for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is under way. The Framework Agreement is intended to expedite the start of restoration in the Gulf in advance of the completion of the injury assessment process. Early restoration is not intended to and does not fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects will be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement, the Trustees released, after public review of a draft, a Phase I ERP in April 2012. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, NOAA issued a public notice in the Federal Register on behalf of the Trustees announcing the development of additional future Early Restoration projects for a Draft Phase III Early Restoration Plan (ERP). This living shoreline project in Pensacola Bay within Escambia County was submitted as an Early Restoration project on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida. In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the project meets Florida's criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by the Spill.

Pensacola Bay, the fifth large estuarine system in Florida (Butts 1998), is located in the northwestern region of Florida. Historical records show that Pensacola Bay once contained extensive seagrass meadows, salt marshes, and harvestable oysters. The influences of overfishing, inadequate sewage disposal, urban stormwater runoff, industrial discharges, dredging, filling, and shoreline hardening have led to a depletion and degradation of these natural resources (Thorpe et al. 1997). Instead of hardening shorelines, a living shorelines approach can be used to reduce shoreline erosion by dampening wave energy while also providing habitat that was once abundant in the region. The NOAA and FDEP are proposing to employ living shoreline techniques in Pensacola Bay to create a total of approximately 18.8 acres of salt marsh habitat and approximately 4 acres of reef habitat to increase benthic secondary productivity.

This project would address the impacts to habitat and biota caused by the *Deep Water Horizon* Oil Spill (See C.F.R. § 990.54(a)(2) and Sections 6a-6c of the Early Restoration Framework Agreement) using established techniques. State and local government agencies have successfully completed similar projects including an earlier phase of the Project Greenshores effort in Pensacola Bay.

12.9.2 Project Location

The proposed Pensacola Bay Living Shoreline Early Restoration project is located in the northern portion of Pensacola Bay in Escambia County, Florida and include the Sanders Beach (30° 23’ 59 N; 87° 13’ 56 W) and Project Greenshores Site II (PGS II) (30° 24’ 37 N; 87° 12’ 10 W) areas (see Figure 12-8). The project would be located on City of Pensacola Sovereign Submerged Lands.

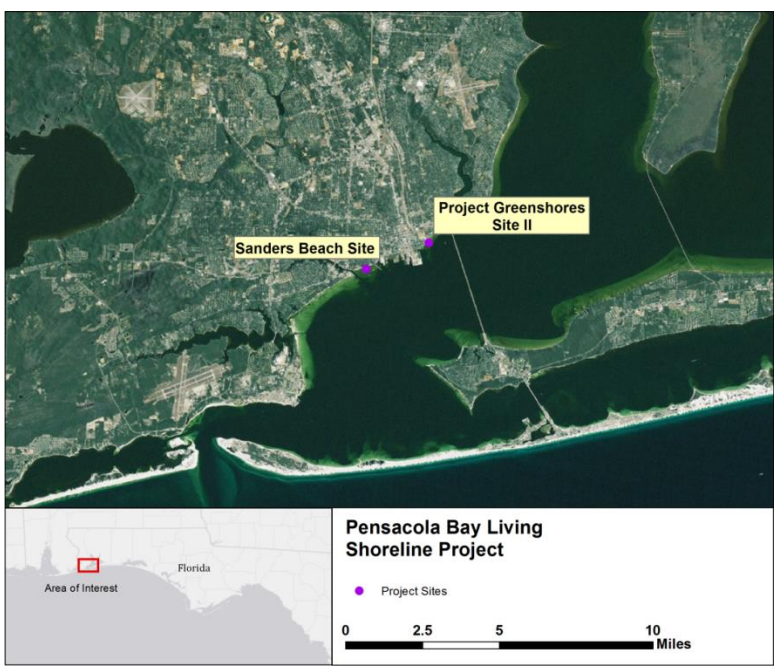

Figure 12-8. General location of proposed Pensacola Bay Living Shorelines Project.

Figure 12-9. Location of proposed PGS Site II and Sanders Beach Sites.

12.9.3 Construction and Installation

12.9.3.1 Engineering and Design

Building upon the experience of NOAA and FDEP on similar efforts such as Project Greenshores, a living shorelines approach would be used in Pensacola Bay. Construction activities would include placement of breakwaters, linear structures that may utilize artificial and/or shell-based materials and salt marsh creation. The final engineering and design process would determine material needs and the placement, alignment, and construction of breakwaters. Materials such as riprap and fossilized oyster shell would be evaluated. The specific breakwater elevation and design would be selected to reduce shoreline erosion, meet state regulatory requirements, and avoid or minimize conflicts with current uses of the proposed sites. The estimated depths for placement of breakwater structures are approximately 4 feet below Mean Lower Low Water (MLLW) at the PGS II and approximately 2 ft below MLLW at the Sanders Beach site. Over time, the breakwaters are expected to develop into reefs colonized by benthic species including, but not limited to, bivalve mollusks (e.g. oysters, clams), annelid worms, shrimps, and crab. Further site evaluations and engineering studies will also determine the salt marsh planting areas and elevations required to maximize successful establishment of a marsh platform that would be planted with local, native vegetation such as Smooth Cordgrass (*Spartina alterniflora).*

Activities associated with breakwater construction and salt marsh habitat creation are regulated by the U.S. Army Corps of Engineers (Corps). The proposed discharge of dredged or fill material into waters of the United States, including wetlands, or work affecting navigable waters associated with this project

will be coordinated with the Corps pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). Coordination with the Corps and final authorization pursuant to CWA/RHA will be conducted during the engineering and design of the project and will be completed prior to project implementation.

12.9.3.2 Constructing Breakwaters

Two construction areas are identified under the Pensacola Bay Living Shoreline Project: 1) PGS II, and 2) Sanders Beach. The final dimensions and placement of the breakwaters will be determined through a design process that includes public involvement, additional investigational studies at the sites, and a permitting process. Therefore, the final footprint for breakwater construction and the number of acres of reef at each site may vary from the description below. However, the overall goal across both project sites is to create approximately 4 acres of reef and 18.8 acres of salt marsh.

1. Construction activities at PGS II would include completion and expansion of an existing breakwater with a crest width anticipated to be 100 ft and total height anticipated to be 3.5 ft. Average water depth is estimated to be -4 ft (below) MLLW, therefore final crest elevation is anticipated to be -0.5 ft (below) MLLW. The calculated volume of material is approximately 11,000 tons of riprap/fossilized oyster shell, but may vary based on final design requirements. It is anticipated that a barge mounted crane (or other similar heavy equipment) would be used to distribute material according to the design cross-section. A footprint of approximately 1.9 acres of fine-grained sediment would be covered with riprap/fossilized oyster shell. Additionally, up to 6 warning signs placed on 12-inch diameter posts would be pushed into the bottom adjacent to the breakwater with appropriate signage for marine traffic. No materials are anticipated for removal from the site. Additional opportunities at PGS II to meet the overall goal of 4 acres of reef habitat will be evaluated during a comprehensive design process for the proposed project.
2. Activities at the Sanders Beach site would include construction of breakwaters up to approximately 2,400 ft long with appropriately sized gaps between structures to maintain tidal exchange. A footprint of up to approximately 3.15 acres of fine-grained sediment would be covered with a riprap/fossilized oyster shell. The breakwaters crest width is anticipated to be 30 ft and total height is anticipated to be 3.5 ft. Average water depth is estimated to be -2.5 ft (below) MLLW, therefore final crest elevation is anticipated to be +0.63 ft (above) MLLW. Calculated volume of material is approximately 14,000 tons of riprap/fossilized oyster shell but may vary based on final design requirements. It is anticipated that a barge mounted crane (or other similar heavy equipment) would be used to distribute material to the design cross-section. Additionally, 8 warning signs placed on 12-inch diameter posts would be pushed into the bottom adjacent to the breakwater with appropriate signage for marine traffic. No materials are anticipated for removal from the site. The final design for Sanders Beach may result in a smaller footprint for the breakwaters based on public involvement and further site studies during the design process.

12.9.3.3 Anticipated Breakwater Construction Process

Breakwaters would be constructed at both sites using a similar process; however, the PGS II has deeper water (approximate 4.5’ depth, on average) and a firmer (sandy) bottom compared to the Sanders Beach site, which has an average water depth of approximately 3.0 ft. The outer limits of the breakwaters would be marked with poles pushed into the bottom and extending approximately 3 ft above the water surface. Prior to working in the area, existing bottom elevations along the breakwater

would be surveyed and elevation controls would be established. The height of the breakwater would be based on bottom elevations and crest elevation. Barriers, navigation warning signs (lighted and unlighted), and other markers would be established along the work area to protect boaters. These would be maintained throughout the project until permanent markers are established. Sign installation methods will be selected to minimize the generation of underwater sound. Therefore, it is expected that sign posts would be pushed in using equipment on-site during breakwater construction, such as a track hoe or may be jetted in if needed.

Best management practices would be implemented to control turbidity levels and meet state requirements during construction activities. The State of Florida requires that turbidity levels are less than or equal to 29 Nephelometric Turbidity Units (NTU) above natural background conditions for waters of the State. Floating turbidity screens that meet FDEP specifications would be deployed during project construction to contain and control turbidity or silt in the project area.

During construction, it is anticipated that one or more work barges with a crane (or other similar heavy equipment) would be positioned along the seaward side of the breakwater. A material barge would be positioned seaward of the work barge in sufficient depth of water, but within reach of the equipment. The work and material barges would safely meet the draft requirements in the areas and be operated and maintained in sufficient draft to the extent practical. Placement of the riprap/fossilized oyster shell would be monitored to ensure the breakwater dimensions, slopes and crest elevation as designed are achieved.

12.9.3.3.1 Salt Marsh Habitat Creation

After the breakwaters have been constructed, selected landward areas would be filled with dredge material obtained from suitable source areas near the project sites. Selection of the type(s) of dredge to be used for marsh creation would be based on the final design and environmental considerations. To avoid potential impacts to protected species, the proposed project would not use a hopper dredge unless required due to site conditions at the selected source sites. Additional site evaluation and sediment testing would also be conducted to identify the most suitable borrow sites. Due to larger sediment grain size and weight characteristic of the area, which settle more quickly, perimeter containment dikes are not anticipated for construction. As described above, floating turbidity screens would be deployed during salt marsh habitat creation activities to control turbidity levels and meet State of Florida requirements. Sediment controls would remain in place throughout the dredging and filling process.

The marsh creation areas would be filled with dredged material beginning at the most landward extent designed for the marshes and filling seaward. Filling with dredge material would continue until marsh elevations determined through the final design process are achieved. Marsh elevations would be designed to meet the requirements of native marsh plant species and to withstand normal wave heights for the project area. Based on similar efforts, it is estimated that a total of approximately 102,000 cubic yards of fill would be required to create 18.8 acres of salt marsh. Sediment controls would remain in place throughout the dredging and filling process. Once the entire marsh creation areas are constructed, local, native emergent vegetation would be planted. The created marsh areas would be monitored to determine success and identify any corrective action needed.

12.9.3.3.2 Anticipated Construction Schedule

Construction is anticipated to take between 6-12 months for all elements. A full schedule would be dependent on the date funding becomes available, contractor award, and any species-specific restrictions required from reviews pursuant to the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. §1531 et seq.). Species-specific issues and BMPs are being addressed with NOAA and DOI as part of separate ESA reviews.

12.9.3.3.3 Best Management Practices

The following industry-accepted BMPs are anticipated for the proposed project:

- Anchoring sites would be situated to avoid impacts to seagrass, if found to be in the project area. Access over existing seagrass would also be avoided to the extent practicable to minimize prop-scarring impacts.
- Floating turbidity screens would be deployed during project construction to contain and control turbidity or silt in the project area. Turbidity levels would be monitored during construction. Additional BMPs would be implemented if turbidity levels exceed local and state regulatory/permit levels.

Some temporary shading from workboats during construction periods may occur; however, it is anticipated that no more than 4 barges would be located on the project site at any time during construction. Assuming barge dimensions of 35'x195', the total shadow effect of the boat/barges is 27,300 sq. ft. In addition to specific measures noted above, the project would adhere to recommendations for *Sea Turtle and Smalltooth Sawfish Construction Conditions* (2006), U.S. Fish and Wildlife Service (USFWS) *Standard Manatee Conditions for In-water Work* (2011), NOAA's *Measures for Reducing Entrapment Risk to Protected Species (2012),* and any applicable federal and state permit conditions. Any BMPs recommended through the ESA consultation process to avoid impacts to Gulf Sturgeon and other protected species would also be implemented.

12.9.4 Operations and Maintenance

Anticipated pre and post project monitoring activities: Monitoring activities would be performed at various times beginning prior to construction and continuing up to seven years post construction. The monitoring activities would include:

- Topographic/bathymetric surveys,
- Vegetation surveys (i.e. species composition and % cover), and
- Biological monitoring (i.e. oyster and invertebrate density and biomass)

Monitoring would ensure project designs are correctly implemented during construction and in a subsequent period, defined by contract, where corrective actions could be taken. Post construction performance monitoring would also be conducted to evaluate the project's performance over time with respect to the agreed upon Offsets, goals, and objectives. In general, components of this monitoring would evaluate the production and support of organisms on the breakwater for the establishment of reefs (e.g., benthic secondary productivity) and the performance of the created salt marsh habitats.

Components of this monitoring would include collecting information with respect to: the breakwater height and structural integrity; salt marsh coverage; water quality parameters (e.g., salinity, dissolved

oxygen), survival of planted species/vegetated area, bivalve and algal presence, coverage, and composition on the reef.

Anticipated Maintenance / Adaptive Management Activities: If the breakwaters are not performing as designed or anticipated, then adaptive management procedures would be used to correct the structures. Adaptive management activities may include adding additional material to the surface of a breakwater, adding additional hardened structure (e.g. riprap), adding additional natural materials (e.g. fossilized oyster shell), and/or replacing warning signs. All monitoring and adaptive management procedures would follow disturbance minimization measures, especially as they relate to vessel use around the project area.

Anticipated short term maintenance activities: For the breakwaters, one maintenance activity would take place within the first four years following construction. The maintenance activity would allow for the capping of the breakwaters with riprap and fossilized oyster shell material. The breakwaters are anticipated to experience the greatest consolidation of the subgrade in the first years following construction. The need for additional placement of rock and shell on the breakwater would be assessed based upon the monitoring plan. Maintenance activity construction methods are similar to the breakwater construction process as described in the Construction and Installation section above. Maintenance activities for the created salt marsh habitat may occur within the first 5 years following construction. Maintenance may include additional plantings of native salt marsh habitat to meet project performance criteria.

Anticipated long term maintenance activities: No long term operations or maintenance requirements are anticipated.

12.9.5 Affected Environment and Environmental Consequences

12.9.5.1 No Action

Both OPA and NEPA require consideration of the No Action alternative. For this Phase III ERP proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

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

12.9.5.2 Physical Environment

12.9.5.2.1 Geology and Substrates

Affected Resources

Geology

The Pensacola Bay system is generally shallow with a total surface area greater than 144 square miles. The system is comprised of several embayments of which Pensacola Bay is the largest followed by East Bay, Escambia Bay, Santa Rosa Sound, Blackwater Bay, and Big Lagoon. The estuarine embayments are within the Gulf Coastal Lowlands subdivision. The lowlands are a series of parallel terraces rising from the coast in successively higher levels. They formed during the Pleistocene Epoch (Great Ice Age) when

fluctuating sea levels were associated with the growth and melting of ice caps. Dunes, barrier islands, beach ridges, and other topographical features were stranded inland as seas receded. Land surfaces of the lowlands are generally level and less than 100 ft above sea level. Substantial areas are less than 30 ft above sea level and are characterized by extensive wetlands. Higher elevations are present in the general area of Pensacola, on the west side of Pensacola and Escambia bays (Thorpe et al. 1997).

Soils

The Pensacola Bay area has been sculptured from an alluvial plain underlain by sand, gravel, silt, and clay. The Soil Survey for Escambia County identifies the areas for the proposed project as "Waters of the Gulf of Mexico" and no soils data is provided. The natural bay shoreline is fringed by wide, shallow sand flats between 3 and 5 ft deep.

Environmental Consequences

The geological and substrate resource in the project area would be affected by the proposed actions through the modification of soft bottom bay habitat into a reef and the excavation of fill materials to create salt marsh habitat. In total, the project would have a footprint of approximately 4 acres where fine-grained sediment would be covered with rip rap/fossilized oyster shell. The proposed PGS II would have a footprint of approximately 1.9 acres; however, this footprint may change based on the design process. The proposed Sanders Beach site would have a footprint of up to approximately 3.15 acres; however, this footprint may change based on the design process. Additionally, a total of up to 14 warning signs placed on 12-inch diameter posts would be installed adjacent to the breakwater with appropriate signage for marine traffic.

The excavation area(s) for fill to create 18.8 acres of salt marsh habitat has not been identified, but would be located near the project sites or a land-based borrow site would be used if neccessary. Fill material would be tested/certified as appropriate for use at the location. Excavation of fill material within the project site would disturb geologic and substrate resources, including infaunal species, through their direct removal. Excavation of fill material within the project site would result in a short-term disturbance to geologic and substrate resources, including infaunal species, through their direct removal.

The proposed breakwater construction to create a reef would result in long-term, moderate benefits to substrate resources through the creation of benthic habitat associated with hard structure reef materials and the dampening of wave energy resulting in a reduction of shoreline erosion. Benefits would be achieved directly at the proposed projects sites and at immediately adjacent areas.

Finding: There would be long-term, moderate direct impacts to geologic and soil (substrate) resources over the life of the project because the existing sandy substrate would be covered with hard structure breakwater materials. However, the net benefits of the habitat creation and erosion reduction outweigh this direct impact by increasing benthic habitat diversity and creating structural complexity which supports a greater diversity and abundance of marine aquatic species. No long term indirect impacts to geologic and soil resources are anticipated due to the abundance of similar benthic habitat nearby that would be unaffected by the project. Short-term disturbance due to on-site excavation of fill material, if required, would be localized and minor. The excavated sites would recover quickly due to sediment movement and repopulation of infauna from adjacent areas.

12.9.5.2.2 Hydrology and Water Quality

Affected Resources

The Pensacola Bay system watershed covers nearly 7,000 square miles in northwest Florida and southern Alabama. It includes a series of interconnected estuaries, including Escambia Bay, Pensacola Bay, Blackwater Bay, East Bay, and Santa Rosa Sound, and three major river systems: the Escambia, Blackwater, and Yellow Rivers. The entire system discharges into the Gulf of Mexico south of Pensacola, Florida. Pensacola Bay borders the City of Pensacola to the north, Escambia Bay to the east, Big Lagoon to the west, and the Gulf Breeze Peninsula and Santa Rosa Island to the south. Pensacola Bay provides the system's outlet to the Gulf of Mexico through an approximately ½ mile wide pass (Caucas Channel). Sources of water to the bay include the system's rivers through adjacent bays, the Gulf of Mexico, and several bayou basins, including Bayou Grande and Bayou Chico. Pensacola Bay is the deepest of the component bays of this system, with an average depth of 19.5 ft (Olinger et al. 1975). Pensacola Bay is a micro tidal estuary with a mixed diurnal/semi-diurnal tide, sometimes there are two highs and two lows in a day and other times only one of each. The nearest National Ocean Service tide gage is located at the Port of Pensacola.

Currents

The circulation in the Pensacola Bay is dependent upon factors such as astronomical tides, wind, river flow, bathymetry, and density variations. The Pensacola Bay is located along a section of coast with a low amount of tidal energy to drive currents within the bay system resulting in a relatively weak tidal-driven circulation. Predicted currents within the Bay have a mean ebb velocity of about 3.0 ft per second directed toward the west-southwest diagonally across the main channel. The mean flood velocity is 2.7 ft per second directed east-northeast. Low slack water occurs from 1 to 3 hours after low water with high slack water occurring approximately 3 to 4 hours after high water. Normal currents have been recorded to be between 3.9 and 4.2 ft per second over a two hour period during the strongest ebb tides and 2.8 ft per second during the strongest flood tides (Ketchen and Staley 1979).

The large scale circulation in the Gulf is influenced by the loop current and associated eddies, wind, waves, and density structures of the water column. The general circulation pattern within the inshore region is more strongly influenced by the astronomical tides, local winds, and also by the open Gulf circulation, which act as a forcing mechanism. The combination of local winds and tides are contributors to the nearshore shelf circulation (U.S. ACOE 1985).

Tides

The tides of Pensacola Bay and Gulf of Mexico are mixed and dominated by diurnal components for much of the lunar cycle, although, some semi-diurnal characteristics are evident during neap tide. Mixed tides are common along most of the Gulf coast with varying strengths of semi-diurnal and diurnal components (Lillycrop 1983). The mean tidal range at the Pass entrance is 1.1 ft and 1.6 ft in the upper reaches of the bay system with neap tide ranges averaging 0.5 ft. The long-term predicted tide range at Pensacola varies from being almost negligible to a maximum 2.7 ft.

Water Quality

Pensacola Bay is within an urbanized watershed. It receives nonpoint source pollution via surface runoff and discharges from Bayou Grande, Bayou Chico and Bayou Texar. Pensacola Bay is identified as an impaired water body by FDEP. Total Maximum Daily Loads have been developed for coliform, identified

as the primary source of impairment. Component bayous, formerly centers of productivity in the system, are now among the most anthropogenically stressed. Most act as sinks for nonpoint source pollution and Bayou Chico has also received substantial historic point source discharges.

The Clean Water Act requires that the surface waters of each state be classified according to designated uses. Florida has six classes with associated designated uses, which are arranged in order of degree of protection required. According to 62.302.400, F.A.C., the majority of the project occurs within Class III waters. Therefore, standards to meet the following uses apply to the project area: Fish Consumption, Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife. The surface waters of the state are Class III unless described in Florida rule. The Pensacola Bay watershed is also identified as a priority waterbody under the Surface Water Improvement Management (SWIM) Program (Thorpe et al. 1997). The SWIM Program was created by Florida to develop comprehensive plans for at-risk water bodies and direct the work needed to restore damaged ecosystems, prevent pollution from stormwater runoff and other sources, and educate the public.

Outstanding Florida Waters

Florida Statutes grant the FDEP authority to establish rules that provide for a special category of waterbodies within the state called Outstanding Florida Waters. Waterbodies with this designation receive special protection because of their natural attributes. There are no waters that are designated as Outstanding Florida Waters located within or adjacent to the project area. A complete listing of Outstanding Florida Waters is provided in Rule 62-302.700 (9), Florida Administrative Code.

Aquatic Preserves

In 1975, Florida enacted the Aquatic Preserve Act to protect Florida's coastline in shallow waters and estuaries. Two aquatic preserves are located in the general area. Ft. Pickens Aquatic Preserve is approximately 4 miles south of the project area. The Yellow River Marsh Aquatic Preserve is located approximately 9 miles to the west. Waters in aquatic preserves and state parks require additional water quality considerations; the State would be consulted to determine any concerns due to proposed project activities.

Floodplain

The project is located in FEMA designated Flood Zones according to the Flood Insurance Rate Maps for Escambia County. FIRM No. 12033C0390G Escambia County, (Effective Date September 29, 2006). The project is located in Zone VE with base flood elevation 11ft. VE indicates coastal flood zones with velocity hazards (wave action) with base flood elevations determined. The Pensacola Bay System includes three major river systems: the Escambia, Blackwater, and Yellow Rivers and smaller tributaries of these rivers and embayments.

Wetlands

The proposed project would be located in open waters. The proposed project sites do not support upland wetlands.

Environmental Consequences

Hydrology

Hydrology, including tides and currents, would be unaffected because the proposed project would have a minimal footprint located adjacent to the shoreline.

Water Quality
The project would have short-term minor direct impacts to the water quality in the area. There would be minor, long term benefits to water quality within the immediate project area by the filtering action of the oysters and other shellfish expected to colonize the constructed breakwater. No indirect, long-term impacts to overall water quality are expected in the vicinity of the project sites due to its small footprint.

Turbidity
Minor siltation may be associated with the dredging and placement operations and its re-suspension may result in a slight increase in turbidity. No significant elevation of turbidity is expected. The State of Florida's waters would not be significantly affected and water clarity would return to ambient conditions shortly after sediment placement at the disposal site. No long-term impacts and only minor short-term impacts are expected to result from the placement of the fill material.

Contaminants
Pre-construction sediment sampling would be conducted to select excavation sites that would provide clean dredged material for the creation of salt marsh habitat. Samples would be analyzed for presence of contaminants and only uncontaminated sources of soils would be utilized. Therefore, no impacts due to contaminants are anticipated as a result of the dredging and placement of fill material.

Outstanding Florida Waters
The project area is not directly in an area designated as an Outstanding Florida Waters, and therefore no direct or indirect impacts are anticipated.

Aquatic Preserves
No impacts are anticipated to Aquatic Preserves due to their distance from the project area.

Floodplains
The majority of the project is located below the mean high water level and would not impact floodplains in or near the project area.

Wetlands
The project is not anticipated to adversely impact wetlands. A more detailed description of salt marsh habitat can be found below. The project would benefit salt marsh habitat through the creation of approximately 18.8 acres.

Findings: There would be no direct adverse effect on hydrology expected from the proposed project. Short term, direct impacts due to proposed construction activities would result in a detectable change to water quality, but the change would be expected to be small and localized. These impacts would quickly become undetectable and State water quality standards as required by the Clean Water Act would not be exceeded. There are no expected short or long term indirect adverse impacts to hydrology, water quality, protected waters, floodplains, or wetlands. The proposed project would result in long-term, moderate, beneficial impacts on wetlands from the creation of marsh habitat as well as long-term minor beneficial impacts on water quality from the establishment over time of reefs on constructed breakwaters that would support species such as oysters that filter water. The proposed discharge of dredged or fill material into waters of the United States, including wetlands, or work affecting navigable waters associated with this project is currently being coordinated with the U.S. Army

Corps of Engineers (Corps) pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). Coordination with the Corps and final authorization pursuant to CWA/RHA will be completed prior to project implementation."

12.9.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

The U.S. Environmental Protection Agency (U.S. EPA) has established the 8-hour ground-level ozone standard. Under this standard, U.S. EPA can designate an area as "nonattainment" if it has violated the 8-hour ozone standard. U.S. EPA may also designate an area as "attainment/unclassifiable," which is an area where monitored air quality data show either that the area has not violated the ozone standard over a three-year period or that there is not enough information to determine the air quality in the area. The entire state of Florida is designated as an attainment area for the 8-hour ozone standard. The current air quality index in the project area is good, with respect to both National Ambient Air Quality Standards (NAAQS) and carbon dioxide (CO_2) emissions.

Greenhouse Gases (GHGs) are chemical compounds found in the Earth's atmosphere that absorb and trap infrared radiation as heat. Global atmospheric GHG concentrations are a product of continuous emission (release) and removal (storage) of GHGs over time. In the natural environment, this release and storage is largely cyclical. The principal GHGs emitted into the atmosphere through human activities are CO_2, methane, nitrous oxide, and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (USEPA 2010). CO_2 is the major GHG emitted, and the burning of fossil fuels accounts for 81 percent of all U.S. GHG emissions (USEPA 2010). Total GHG emissions in the state of Florida from 1990 to 2007 have increased at an average rate of 2.1% per year. Total GHG emissions in 2007 were 290 million metric tons of CO_2 equivalent ($MMTCO_2E$). In 2007, 91 percent of GHG emissions in Florida were CO_2 emissions (FDEP 2010).

Environmental Consequences

Air quality would be temporarily and insignificantly affected by the proposed action. Emissions are expected to occur and would result from the operation of the construction equipment, and any other support equipment which may be on or adjacent to the job site. Construction activities are anticipated to be completed within 12 months. The project area is currently in attainment with National Ambient Air Quality Standards parameters. The proposed action would not affect the attainment status of the project area or region. A State Implementation Plan conformity determination (42 United States Code 7506 (c)) is not required since the project area is in attainment for all criteria pollutants.

Finding: There would be only short term, minor direct impacts to air quality by the proposed action. No indirect impacts to air quality are expected. Based on the relatively small amount of construction equipment and short construction timeframe, the project would have short-term minor impacts but no long-term impacts on GHG emissions.

12.9.5.2.4 Noise

Affected Resources

Terrestrial and marine wildlife have a range of sensitivities to noise, which may affect their behavior and ability to utilize areas affected by noise. Unfortunately, specific noise tolerance levels for species and

their impacts are not well established in the literature. Ambient noise levels in the project area are low to moderate. The major noise producing sources in the proposed project area year round are urbanized areas, adjacent roads, and recreational and port related boating traffic. Ambient noise is comprised of a variety of both natural and man-made sounds. Natural and man-made sources of noise affecting terrestrial areas include wind, wildlife (such as birds), construction, roads, air planes, and other urban sources. Natural sources of underwater sound include: earthquakes, wave action, wind, and rain, as well as sounds produced by marine animals. Major contributors of man-made sources of underwater sound include: commercial ships and recreational watercraft, oil and gas exploration, sonar, marine pile driving, and underwater explosions.

Many species are sensitive to noise levels; for example, nesting birds have been observed to abandon nests due to high levels or prolonged exposure to noise. Marine mammals have evolved an extremely sharp sense of hearing in marine environments where sound is very reliable, especially over long distances. Marine mammals can distinguish biologically important signals among many different underwater sounds; however, some types of sound may disrupt or injure marine mammals. The impacts of noise depend on a variety of factors including the species and behavior of the animal, as well as the frequency, intensity, and duration of the noise. Pile driving construction projects associated with bridge construction have used interim fish injury thresholds in consultation with NMFS of a peak sound pressure level of 208 decibel (dB) and a cumulative sound exposure of 187dB. There is evidence that no injuries to fish occur at cumulative sound exposure levels above 187 dB, therefore these interim levels are considered conservative (FHA 2012).

Environmental Consequences

Noise from construction equipment such as the dredge and other associated equipment would be evident in the project area. While this noise would be evident to those workers on the job and any users of the beach in proximity of the project, it would be short-term and insignificant. Normal noise levels would be achieved at the end of each workday and after completion of construction, anticipated to take approximately 10 to 12 months. The project is not anticipated to increase vessel traffic or noise impacts in the long term. Warning signs onposts less than 12-inches in diameter would be installed in sandy substrates; therefore, it is anticipated they would be pushed into the bottom with equipment used during construction (e.g. backhoe). Underwater noise levels, both peak levels and cumulative exposure, are expected to remain below levels that would adversely affect marine species. Marine species such as sea turtles, dolphin, and manatee that may potentially occur within the project area are mobile and have the ability to move away from the proposed project area. In addition, conservation conditions will be implemented during construction to monitor for the occurrence of these species to avoid adverse impacts.

Finding: The proposed activities would result in short term, minor impacts to noise due to use of construction equipment. There would be short term indirect impacts due to construction noise to wildlife that may occur within the vicinity of the project. Pre-construction surveys would identify any nesting bird species that may be disturbed by construction noise and BMPs developed in consultation with USFWS would be implemented to minimize this potential disturbance. The Trustees evaluated the potential for take of Marine Mammals under the MMPA and due to these species' mobility and the implementation of NMFS' *Sea Turtle and Smalltooth Sawfish Construction Standards*, NMFS' *Measures for Reducing Entrapment Risk to Protected Species* (2012), *Standard Manatee Conditions for In-Water*

Work (USFWS 2011), and USFWS recommended conservation measures for listed species and other trust resources, take of marine mammals under the MMPA is not anticipated.

12.9.5.3 Biological Environment

The Pensacola Bay system supports an array of biological communities and species characteristic of a northern Gulf of Mexico estuary. Estuarine habitats include tidal flats, benthic microalgae communities, seagrass beds, oyster beds, tidal marshes, and planktonic and pelagic communities. These resources in the Pensacola Bay system have been subject to sustained anthropogenic stress for some time.

12.9.5.3.1 Living Coastal and Marine Resources

Coastal and Submerged Aquatic Vegetation

Affected Resources

Submerged Aquatic Vegetation (SAV) or seagrasses are rooted vascular plants that grow in fresh, brackish, and saltwater in areas dominated by soft substrates such as sand or mud. Marine species of seagrasses, grow in the littoral (intertidal) and sublittoral (subtidal) zones of oceans. Freshwater and brackish seagrass species are important components of estuary systems and inland waters. In the northern Gulf of Mexico six species of seagrasses are common (Table 12-8).

Table 12-8. Common Seagrass species in the Gulf of Mexico.

Species Common Name	Scientific Name
Manatee grass	*Syringodium filiforme*
Shoal grass	*Halodule wrightii*
Turtle grass	*Thalassia testudinum*
Widgeon grass	*Ruppia maritima*
Paddle grass	*Halophila decipiens*
Star grass	*Halophila engelmannii*

The presence and productivity of seagrasses in nearshore environments largely depends upon light availability. Seagrasses are generally restricted to shallow ocean or estuarine waters due to the rapid decline of light with depth (Green and Short 2003). In addition to the availability of light, water temperature, salinity, sediment and water nutrient content, wave fetch (length of open water over which the wind can blow unimpeded), turbidity, and water depth (U.S. Fish and Wildlife Service [USFWS] 1999a; Koch 2001; Merino et al. 2005) affect seagrasses. Seagrasses generally grow in salinities that range from freshwater to 42 parts per thousand (ppt) and can tolerate short-term salinity fluctuations, but most have an optimum salinity range from 24 to 35 ppt.

Seagrasses, as well as freshwater and brackish SAV, provide essential food, shelter, and nursery habitats for commercial- and recreational-fishery species and for the many other organisms such as shrimp that live and feed in seagrass beds or shallow marshes. In addition, seagrass beds can serve as Essential Fish Habitat (EFH) for federally managed species. Besides offering habitat, food, and shelter for many species, seagrasses filter contaminants and sediments, improve water quality, produce and export organic matter, dampen wave energy and currents, and improve the overall ecosystem through landscape-level biodiversity (Dawes et al. 2004).

Seagrasses were formerly abundant in this system but have functionally "disappeared" from the system since the mid-1970s, with the exception of Santa Rosa Sound (Collard 1991a; 1991b). A great deal has been written concerning the loss of seagrasses in the Pensacola Bay system (Hopkins 1973; Rogers and Bisterfield 1975; Olinger et al. 1975; Stith et al. 1984; Reidenauer and Shambaugh 1986). The most current study of seagrass coverage for the Pensacola Bay area was conducted more than 10 years ago by the U.S. Geological Survey National Wetlands Research Center by using natural-color aerial photography taken in 1992 at a 1:24,000 scale as part of the northeastern Gulf of Mexico seagrass mapping project.

Major causes of seagrass loss in Pensacola Bay were sewage and industrial waste discharges, dredge and fill activities, beachfront alteration, and changing watershed and land-use characteristics. According to the U.S. EPA (1975), the disappearance of several small beds near the north end of the Pensacola Bay Bridge was documented in 1951 and was likely attributable to dredging. In 1960, 372 ha (918 acres) of seagrass were mapped. In that same year, the Port of Pensacola was enlarged, which involved extensive dredge and fill activities. Additional dredging was done to the port in 1967. Most beds declined along the southern shore of Pensacola Bay and East Bay and disappeared by 1974. Based on historical data, seagrasses in Pensacola Bay declined from 372 ha (918 acres) in 1960 to 56 ha (137 acres) in 1980. In 1992, seagrass beds had increased to 114 ha (282 acres). Santa Rosa Sound and Big Lagoon are two of the few remaining bodies of water within the Pensacola Bay system that still harbor seagrass beds (Schwenning et al. 2007).

The Project GreenShores initiative included efforts to restore seagrasses. In 2003, the first phase at Project GreenShores at Site I planted 3,900 propagated seedlings of *Ruppia maritima*. Subsequent surveys have shown that of the total of 30 plots of seagrass planted, most were lost due to Hurricane Ivan in 2004. Additional plantings were held at Site 1 to continue efforts to establish seagrasses. From 2004 to 2006 a series of *Ruppia maritima* plots and mats totaling 74.23 m^2 were planted. In May 2007, surveys by the FDEP found 10,051 m^2 present from those plantings occurring landward of the created marsh islands. During the 2007 survey, *Ruppia maritima* was the only species found except at one monitoring site, which contained *Halodule wrightii* (50% cover, 1m^2 plot).

Volunteer plantings of *Ruppia maritima* and *Halodule wrightii* also took place in 2007-2008 at Project GreenShores Site II. Observations since plantings indicate that predominately *Ruppia maritima* has survived within an area called Hawkshaw Lagoon, an artificially created lagoon adjacent to shoreline revetted with a mix of limestone and concrete rubble. At the Project Greenshores Site II, some *Ruppia maritima* and *Halodule wrightii* may be present in the general area as a result of previous restoration attempts (last known planting was in 2008), but seagrasses are not believed to be within or adjacent to the footprint of the proposed breakwater structure or marsh creation areas. Seagrasses are not known to be present in the Sanders Beach project area.

Environmental Consequences

The occurrence of seagrasses within or adjacent to construction activities is unlikely due to site conditions such as water depth, wave energy, water quality, and other past disturbance. Therefore, no environmental consequences to seagrass beds are anticipated. Instead, the proposed project is likely to benefit water quality and reduce near-shore wave energy within the project area, which may make conditions more favorable for the re-establishment of seagrasses.

Finding: Due to the either lack of existing seagrass beds or minimal coverage of seagrass in the project area, no direct, adverse impacts from the proposed activities are expected. If determined as necessary, surveys for seagrass would be conducted within the footprint of construction activities. Additionally, best management practices to avoid impacts to seagrass have been incorporated into the construction process including 1) anchoring sites would be situated to avoid impacts to seagrass, if found to be in the project area; 2) access over existing seagrass would be avoided to the extent practicable to minimize prop-scarring impacts; and 3) turbidity levels would be monitored during construction and additional BMPs would be implemented if turbidity levels based upon local and state regulatory/permit levels. No indirect adverse impacts to seagrass beds are expected due to the small footprint of the proposed activities. The project may result in long term indirect benefits to seagrass beds due to the anticipated reduction in wave energy and improvements to water quality within the project area.

12.9.5.4 Salt Marsh

Affected Resources

Most salt marsh habitat in the Pensacola Bay system occurs in the lower portions of river floodplains and tidal creeks (Stith et al. 1984). The proposed project would be located in open waters. Restoration of salt marsh habitat has occurred within Pensacola Bay as part of Project GreenShores efforts; however, salt marsh wetlands do not occur within the Sanders Beach site project area. Project GreenShores included the creation of salt marsh habitat at two sites (Figure 12-10). In 2003, eight acres of salt marsh was created at Site 1 using 35,000 cubic yards of fill and planted with 40,000 *Spartina alterniflora* plants. In 2007, three intertidal marsh islands were created at Site 2 using 16,000 cubic yards of fill and planted with 30,000 *Spartina alterniflora* plants. These created marsh areas have suffered losses in area due to storms and other site conditions that resulted in erosion and migration of the intertidal marsh islands.

Environmental Consequences

The proposed project activities would include construction of breakwaters in open water areas that currently do not support salt marsh habitat. The breakwaters would be sited and designed to reduce the wave energy affecting the shoreline within the project area, resulting in long-term beneficial impacts to existing salt marsh habitat. The project goals also include the creation and planting of approximately 18.8 acres of salt marsh habitat. The selection of sites for the excavation of fill to create salt marsh would be based upon additional engineering studies and surveys of the project area. Selected excavation sites, as well as sites for marsh creation, would be chosen to prevent or minimize potential adverse impacts on existing marsh areas within the project area.

Figure 12-10. Project Green Shores Site 1 & 2.

Finding: No adverse direct impacts to salt marsh habitats are anticipated due to the selection of open water sites for breakwater construction and dredging activities. Instead, the proposed project would have long-term direct benefits by creating and protecting approximately 18.8 acres of salt marsh through the proposed living shoreline techniques. In addition, the proposed project would have long-term indirect benefits to salt marsh habitat at adjacent locations by reducing the wave energy affecting the shoreline and reducing the potential erosion of existing habitats.

12.9.5.5 Protected Species

The Trusteeshave reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by both USFWS and NOAA. For consultation with USFWS, the Trusteesfirst reviewed the species list for Escambiia County, Florida[6]. Table 12-9 presents a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

[6] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

Table 12-9. List of State and Federally Protected Threatened and Endangered Species for Escambia County.

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle, Hawksbill turtle, Kemp's ridley turtle; Leatherback turtle, Loggerhead turtle	The main risk to sea turtles during implementation of this project would come from in-water boat/material collisions during construction which could result in harm or mortality. Consultation has been completed with NMFS, the agency that has jurisdiction to review impacts to sea turtles in the estuarine and marine environments. There will be a limited amount of terrestrial work to develop the salt marsh habitat. However, sea turtles are not known to nest on the surrounding beaches. Therefore, no impacts to nesting sea turtles are anticipated No proposed or designated critical habitat for sea turtles occurs within the action area; therefore, none will be adversely affected or modified.
West Indian manatee	The county in the project area is not part of the 36 Florida counties that are identified as being counties where manatees regularly occur in coastal and inland waters (U.S. Department of the Interior, 2011). However, manatees could be present in the project waters (U.S. Department of the Interior, 2011). The main risk to manatees during implementation of this project would come from in-water boat/material collisions which could result in harm or mortality. Measures to avoid these impacts are described below.
Piping plover and Red knot	Habitat at the project site is not typically used by piping plover or red knot. However, individuals could be present during the wintering period. The main risk to Piping plovers and Red knots is from human disturbance while resting and foraging in habitats adjacent to work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause individuals to move to a nearby area. Because foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The proposed project will not result in any changes to shoreline habitats where piping plover could be feeding or resting and is not expected to increase visitor use; therefore, no indirect impacts are expected. Piping plover critical habitat is not designated in or near the action.
Gulf sturgeon	NMFS is providing consultation for Gulf sturgeon and its Critical Habitat in the estuarine environment. As a result, Gulf Sturgeon will not be considered in the consultation with the USFWS.

In addition to the protected species managed by USFWS, the Trusteesreviewed the proposed projects and associated actions for potential impacts to the following protected species managed by NMFS (status indicated) and their associated critical habitat, if appropriate:

- Gulf Sturgeon, *Acipenser oxyrinchus desotoi*, Threatened
- Smalltooth Sawfish, *Pristis pectinata,* Endangered
- Green Sea Turtle, *Chelonia mydas*, Endangered
- Loggerhead Sea Turtle, *Caretta caretta*, Threatened
- Hawksbill Sea Turtle, *Eretmochelys imbricata*, Endangered
- Leatherback Sea Turtle, *Dermochelys coriacea*, Endangered
- Kemp's Ridley Sea Turtle, *Lepidochelys kempii*, Endangered.

Detailed information for a number of the species considered follows.

Affected Resources for Protected Species

12.9.5.6 Sea Turtles

There are five species of sea turtles that are found within the Gulf of Mexico: green sea turtle, hawksbill sea turtle, loggerhead sea turtle, Kemp's ridley sea turtle, and leatherback sea turtle. All five species of sea turtles found in the Gulf of Mexico are listed under the ESA. The Gulf populations of green (breeding populations in Florida), hawksbill, Kemp's ridley, and leatherback sea turtles are listed as endangered. Loggerhead (northwest Atlantic distinct population segment) and green (except the Florida breeding population) sea turtles are listed as threatened.

Sea turtles in the Gulf (with the exception of the leatherback turtle) have a life history cycle where hatchlings develop in open ocean areas (e.g., continental shelf) and juvenile and adult turtles move landward and inhabit coastal areas. Leatherback turtles spend both the developmental and adult life stages in the open oceanic areas of the Gulf of Mexico (Dow et al. 2012). Sea turtles nest on low and high energy ocean beaches and on sandy beaches in some estuarine areas. Immediately after hatchlings emerge from the nest, they begin a period of frenzied activity. During this active period, hatchlings move from their nest to the surf, swim, and are swept through the surf zone, and continue swimming away from land for up to several days (NOAA 2009a). Once hatchling turtles reach the juvenile stage, they move to nearshore coastal areas to forage. As adults, they utilize many of the same nearshore habitats as during the juvenile developmental stage. Sea turtles utilize resources in coral reefs, shallow water habitat (including areas of seagrasses), and areas with rocky bottoms.

All five species of sea turtles are migratory and thus have a wide geographic range (Dow et al. 2012). All five species have been observed within the Gulf Island National Seashore nesting, swimming, or feeding on the Gulf side of Santa Rosa Island or swimming or feeding on seagrass on the bay side of Santa Rosa Island (NPS 2010). Sea turtle nesting does not occur on the bay side of Santa Rosa Island (NPS 2010). The most observed nesting beaches have been found in Florida (primarily used by loggerheads, green, and leatherback sea turtles) (Dow et al. 2012); however, the PGS II does not contain beach habitat and the Sanders Beach site does not contain suitable nesting areas for sea turtles due shoreline armoring, the very small geographic area containing sand, and high recreational use.

Marine Mammals

Twenty-two marine mammals are native to the Gulf of Mexico: 21 pelagic species of whales and dolphins, and the West Indian manatee. Three species commonly occur at nearby Gulf Islands National Seashore and may therefore occur in the waters surrounding the proposed project: the bottlenose dolphin, *Tursiops truncatus,* Atlantic spotted dolphin, *Stenella frontalis*, and the West Indian manatee (*Trichechus manatus)*. Whales are rare transients in the national seashore waters and would not be expected to use the shallow waters of the proposed project area.

Dolphin Species

The bottlenose dolphin, *Tursiops truncatus*, and the Atlantic spotted dolphin, *Stenella frontalis*, are the two most common marine mammals found in the Gulf of Mexico. Both species feed primarily on fish, squid and crustaceans. While the Atlantic spotted dolphin spends the majority of its life offshore, the bottlenose dolphin often travels into coastal bays and inlets for feeding and reproduction. Dolphins are protected under the Marine Mammal Protection Act (MMPA) of 1972, as amended (16 United States

Code [U.S.C.] 1361 et seq.). NMFS has classified five U.S. stocks of bottlenose dolphins as "strategic" stocks: Eastern Gulf of Mexico Coastal; Western Gulf of Mexico Coastal; Northern Gulf of Mexico Coastal; Gulf of Mexico Bay, Sound and Estuarine; and Western North Atlantic Coastal.

West Indian Manatee

The Florida manatee (*Trichechus manatus latirostrus*), a subspecies of the West Indian manatee, is listed as a federally endangered species protected under the ESA. The main threat to the Florida manatee is increased boat traffic and other accidents associated with the expanding development in Florida. Manatees inhabit both salt and fresh water and can be found in shallow (5 ft to usually <20 ft), slow-moving rivers, estuaries, saltwater bays, canals, and coastal areas throughout their range where they feed on seagrass and other aquatic vegetation such as hydrilla and water lettuce.

The distribution of manatees is well known in Florida through telemetry and other studies over the past 20 years. When ambient water temperatures drop below 20° C (68°F) in autumn and winter, manatees aggregate within the confines of natural and artificial warm-water refuges (U.S. FWS 2010) or move to the southern tip of Florida. On the West coast of Florida, the northernmost natural winter refugia is Crystal River; however, several artificial (power plant warm-water outfalls, boat basins) and minor winter refugia may be used temporarily. As water temperatures rise manatees disperse from winter aggregation areas. While some remain near their winter refuges, others undertake extensive travels along the coast and far up rivers and canals. On the west coast, sightings drop off sharply west of the Suwannee River in Florida (Marine Mammal Commission 1986), although a small number of animals are seen each summer in the Wakulla River at the base of the Florida Panhandle (U.S. FWS 2010).

At nearby Gulf Islands National Seashore manatee sightings are rare but have been documented primarily in the Gulf of Mexico. Some individuals have (less frequently) been documented in Pensacola Bay and likely in the area north of Santa Rosa Island (east of the project area), as well as the Perdido Key area (Perdido Key is also located within the Gulf Islands National Seashore, but is west of the project site), where seagrass beds are present (NPS 2010).

The West Indian Manatee is designated as endangered under the ESA and depleted under the Marine Mammal Protection Act (16 United States Code [U.S.C.] 1361 et seq.). In the Gulf Coast geographic area manatees are divided into two regional management units: the northwest and the southwest regional management units. Each regional unit is composed of individuals that tend to return to the same network of warm water refuges each winter and have similar non-winter distribution patterns (FWC 2007). In addition, Florida enacted the Manatee Sanctuary Act in 1978 and declares the entire State of Florida to be a manatee “refuge and sanctuary” (FWC 2007).The FWC has developed a Florida Manatee Management Plan to provide a framework for conserving and managing manatees in Florida (FWC 2007).

Gulf Sturgeon

The NMFS and USFWS listed the Gulf sturgeon (*Acipenser oxyrinchus desotoi)* as a threatened species on September 30, 1991. The Gulf sturgeon, also known as the Gulf of Mexico sturgeon, is a subspecies of the Atlantic sturgeon. Adults are 180 to 240 cm (71-95 inches) in length, with adult females larger than adult males. Adult fish are bottom feeders, eating primarily invertebrates, including brachiopods, insect larvae, mollusks, worms and crustaceans. The Gulf sturgeon is an anadromous fish that migrates from salt water into coastal rivers during the warmer months to spawn. Historically, the Gulf sturgeon

occurred from the Pearl River to Charlotte Harbor, Florida. It still occurs, at least occasionally, throughout this range, but in greatly reduced numbers. River systems where the Gulf sturgeon are known to be viable today include the Mississippi, Pearl, Escambia, Yellow, Choctawhatchee, Apalachicola, and Swannee Rivers, and possibly others. The Gulf sturgeon often stays in the Gulf of Mexico and its estuaries and bays in cooler months (NOAA 2013). Most adult feeding takes place in the Gulf of Mexico and its estuaries. Telemetry data in the Gulf of Mexico usually locate sturgeon in depths of 6 m (19.8 ft) or less (federal notice). The fish return to breed in the river system in which they hatched. Spawning occurs in areas of deeper water with clean (rock and rubble) bottoms. The eggs are sticky and adhere in clumps to snags, outcroppings, or other clean surfaces. Sexual maturity is reached between the ages of 8 and 12 years for females and 7 and 10 years for males. The Gulf sturgeon historically was threatened because of overfishing and then by habitat loss due to construction of water control structures, dredging, groundwater extraction, and flow alterations.

USFWS and NMFS designated critical habitat essential to the conservation of the Gulf sturgeon. In accordance with regulations, critical habitat determinations were based on the best scientific data available for those physical and biological features (Primary Constituent Elements) essential to the conservation of the species. Nearshore waters within one nautical mile of the mainland from Pensacola Pass to Apalachicola Bay and the Perdido Key area and the area north of Santa Rosa Island were designated as critical habitat, as they are believed to be important migratory pathways between Pensacola Bay and the Gulf of Mexico for winter feeding and genetic exchange (DOI 2003). The proposed project area is located in critical habitat Unit 9 (Pensacola Bay), which provides juvenile, subadult, and adult feeding, resting, and passage habitat for Gulf sturgeon from the Escambia River and Blackwater/Yellow River subpopulations.

Saltmarsh Topminnow

The saltmarsh topminnow was identified by NMFS as a federal Candidate Species in 1991 (56 FR 26797) and transferred to the Species of Concern list on April 15, 2004 (69 FR 19975).The saltmarsh topminnow is also protected as a State Species of Special Concern by Florida's Endangered and Threatened Species Rule. The saltmarsh topminnow (*Fundulus jenkinsi*) ranges from Galveston Bay, Texas to Pensacola/Escambia Bay, Florida. In Florida the range is limited to Perdido Bay and Pensacola/Escambia Bay estuaries (Gilbert and Relyea 1992; Lopez et al. 2010b; Peterson et al. 2003; Thompson 1999; NOAA 2009a). Small, interconnected dendritic intertidal creeks linking the mid and high salt marshes are key components to the survival of the species (Lopez et al. 2010; Lopez et al. 2010b; Thompson 1999). Marsh erosion, low stem density, conversion of marsh to deeper open areas, dredging, hard shoreline structures, and sea level rise are also major factors contributing to the habitat decline in areas used by the saltmarsh topminnow (Lopez et al. 2010b; Peterson et al. 2003; Thompson 1999). The population of saltmarsh topminnows appears to be declining with loss of habitat (NOAA 2007). Patchy populations within the Pensacola Bay system indicate that the species is more prevalent than first believed (Bass et al. 2004).

Smalltoosh Sawfish

The smalltooth sawfish, *Pristis pectinata*, is federally listed as an endangered species. Formerly common from Texas to North Carolina, its current distribution is mainly restricted to South Florida and the Keys; adults are uncommon in the Florida panhandle (NOAA 2009b). Juveniles inhabit shallow coastal waters, especially shallow mud banks and mangrove habitats. Very few juveniles have been documented in areas north of the current range of mangroves (*i.e.*, north of 29N latitude). Adults are found with

juveniles but also in deeper water habitat (NOAA 2009b). The decline of this species is mainly attributed to mortality as bycatch in commercial and sport fisheries. The current range of this species has contracted to the peninsula of Florida, though smalltooth sawfish are common only in the Everglades region at the southern tip of the state.

Protected Bird Species

The USFWS and FWC have identified several bird species that require special protection status. However, limited habitat availability and quality in the project area is likely to reduce their direct use and occurrence within the project area.

Threatened and Endangered Bird Species

Two Federally listed bird species, the piping plover and the wood stork, and one proposed species, the red knot, are known to occur in the Florida panhandle.

The piping plover is a small North American shorebird that inhabits sandy beaches, sand flats, and mudflats along coastal areas. Piping plovers do not breed in Florida, but spend a large portion of their year wintering in the state. The final rule designating critical habitat for the wintering population of piping plover was published in the Federal Register (Vol. 66, No. 132) on July 10, 2001 (50 C.F.R. Part 17). In Escambia County Florida, designated critical habitats for wintering populations of piping plovers are outside the project area at Big Lagoon State Recreation Area, areas near Big Sabine Point on Santa Rosa Sound, and Navarre Beach.

The red knot, a federal proposed species, uses the state of Florida both for wintering habitat and migration stopover habitat for those that continue to migrate down to specific wintering locations in South America (Niles et al. 2008). Wintering and migrating red knots forage along sandy beaches, tidal mudflats, saltmarshes, and peat banks (Harrington 2001). Observations indicate that red knots also forage on oyster reef and exposed bay bottoms, and roost on high sand flats, reefs, and other sites protected from high tides (Niles et al. 2008). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Threats to wintering and stopover habitat in Florida include shoreline development, hardening, dredging, deposition, and beach raking (Niles et al. 2008).

The U.S. breeding population of wood storks is listed as federally endangered The wood stork is the largest wading bird breeding in the United States and is a highly colonial species usually nesting in large rookeries and feeding in flocks. Wood storks generally utilize freshwater wetlands as primary habitat; however, during times of drought, depressions in brackish marshes become important habitat components. Colonies in South Florida form late November to early March, while wood storks in Central and North Florida form colonies from February to March. Wood storks move north after breeding. There have been occasional sightings in all States along and east of the Mississippi River.

Bald and Golden Eagle Protection Act

The bald eagle was delisted by the USFWS and is not listed as threatened or endangered by the FWC. The bald eagle is, however, protected by state law pursuant to 68A-16, Fla. Admin. Code and by the U.S. government under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles occur most commonly in areas close to coastal areas, bays, rivers, lakes, or other bodies of water that provide concentrations of food sources, including fish, waterfowl, and wading birds. Usually the bald eagle nests in tall trees (mostly live pines) that provide clear views of surrounding area. Bald eagles

feed on fish and other readily available mammalian and avian species and are dependent on large, open expanses of water for foraging habitat. In Florida, conservation measures to protect active nest sites during nesting season must be considered to reduce potential disturbances of certain project activities. If bald eagles are found nesting within 660 feet of a proposed construction area, then activities would need to occur outside of nesting season or coordination with the USFWS would occur to determine if a permit is needed, and Florida's *Bald Eagle Management Plan* guidelines would be followed (FWC 2008). The nearest Bald eagle nest is approximately 4 to 5 miles from the project site.

Migratory Birds

The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711) decreed that all migratory birds and their parts (including eggs, nests, and feathers) were fully protected. The migratory bird species protected by the Act are listed in 50 C.F.R. 10.13. More than 250 species of birds have been reported as migratory or permanent residents within the Pensacola Bay system, several of which breed there as well. These birds can be grouped generally as (1) species that occur year-round, both nesting and overwintering, (2) species that nest during the warm season and overwinter to the south, (3) species that overwinter and nest further north, and (4) species that pass through during spring migrations to more northern nesting sites and/or during fall migrations to overwintering areas. Different populations of the same species sometimes exhibit more than one type of migratory behavior. Shorebirds include species such as osprey (*Pandion haliaetus*), great blue heron (*Ardea herodias*), great egret (*Casmerodius albus*), stilt (*Himantopus mexicanus*), sandpipers (*Calidris spp*.), gulls (*Lanius spp.*), brown and white pelicans (*Pelecanus spp*.), American oystercatcher (*Haematopus palliatus*), and terns (*Sterna spp*.) (Thorpe et al. 1997).

Waterfowl

Waterfowl include swans, geese, and ducks that migrate from summer nesting areas in the northern U.S. and Canada along well-described routes or "flyways" to wintering grounds along the Gulf Coast. In addition to waterfowl, other water-dependent birds of the Gulf region include loons, grebes, northern gannet, pelicans and frigate birds, cormorants and an ally, the anhinga, gulls, terns, and various seabirds.

Pelagic seabird species

Pelagic seabird species live most of their lives in open marine waters roosting and feeding at the water surface the entire year; in the breeding season, mature adults return briefly to nesting areas along coastlines. Nesting of pelagic species in the Gulf of Mexico region is very limited and includes only a few locations containing tern colonies. Species regularly observed within the Gulf of Mexico include tropicbirds, boobies, gannets, shearwaters, storm-petrels, jaegers, and phalaropes (Peake and Elwonger 1996). Gull and tern species are also considered pelagic species; however, as colonial nesting species they are discussed with colonial water birds below.

Raptors

Raptors that occur along the Gulf Coast include vultures, osprey, kites, hawks, harriers, caracaras, eagles, and falcons. Raptors may be found as year-round resident species, migrants, and wintering species. Year-round resident species include turkey vulture, black vulture, white-tailed kite, red-shouldered hawk, red-tailed hawk, and American kestrel. In addition to these resident raptor species, the crested caracara and white-tailed hawk are resident raptor species with restricted North American ranges and are considered unique to the Gulf Coast region.

Osprey, northern harrier, sharp-shinned hawk, Cooper's hawk, merlin, and peregrine falcon winter along the Gulf Coast, though some species such as the osprey may also be present as residents in parts of the Gulf Coast (Brinkley 2008).

Colonial waterbirds

Colonial waterbirds are birds that nest in social nesting groups (colonies) often containing a mix of species of a similar group, e.g., a wading bird colony may include multiple species of herons and egrets. This guild consists of two principal groups: wading birds (e.g., herons, egrets, ibises) and ground- or beach-nesting species. Ground-nesting species can be further divided into species that feed in pelagic (open water) habitats such as cormorants, gulls, and terns. In addition, brown pelicans may occasionally nest on the ground (FWS 2002).

Colonial waterbirds feed mostly on aquatic organisms, and as a result, nesting colonies are usually concentrated within appropriate coastal habitats. The location and size of nesting colonies depend directly on the presence of suitable nesting habitat and adequate food availability (Duke and Kruczynski 1992). A substantial percentage of the U.S. population of several species nest within the nearshore environment of the Gulf of Mexico: laughing gull; Forster's, gull-billed, sandwich, least, royal, and Caspian terns; and black skimmer. Florida, Louisiana, and Texas are the primary states in the southern and southeastern U.S. for nesting colony sites and total number of nesting coastal and marine birds (U.S. DOI 2006).

Wading birds

Wading birds consist of birds with long legs, long necks, and long bills that facilitate foraging in shallow water, probing or actively capturing fish, frogs, aquatic insects, crustaceans, and other prey (Terres 1991). Wading bird families found along the Gulf Coast include herons and egrets (family Ardeidae), storks (Ciconiidae), ibises and spoonbills (family Threskiornithidae), and cranes (family Gruidae). Typical wading bird species include great blue heron, great egret, snowy egret, little blue heron, and tricolored heron. Reddish egret and roseate spoonbill are two species within the U.S. restricted in range to the Gulf Coast region. Wading bird colonies are also referred to as "rookeries" or "heronries".

Shorebirds

Shorebirds are generally restricted to coastline and inland water margins (beaches, mudflats, etc.). As a group, shorebirds are highly migratory and many of these species stop to rest and forage during migration flights or spend the winter in nearshore habitat along the Gulf Coast. The Gulf Coast contains some of the most important shorebird habitat in North America. For migrating and wintering shorebirds the wetlands and barrier islands of this region represent the first large expanses of suitable habitat between northern breeding grounds and more distant wintering grounds in South America (Withers 2002).

Marsh birds

"Marsh bird" is a general term for birds that live in or around marshes and swamps. Passerine species associated with marshes include red-winged blackbird and boat-tailed and great-tailed grackle; however, other marsh species are more secretive. Gulf Coast marshes and freshwater wetlands provide habitat for secretive marsh birds, which are cryptically colored with secretive behaviors and specially adapted to life in the treeless, dense marsh vegetation (FWS 2006).

Along the Gulf Coast, bird species found in salt and freshwater marshes include grebes, bitterns, rails, gallinules, limpkin, and passerines exemplified by marsh wren, sedge wren, and the seaside sparrow species complex. Other marsh bird species with more northern breeding ranges winter in Gulf Coast marshes such as yellow rail, sora, Virginia rail, and Nelson's sparrow.

Passerines

Passerines (e.g., flycatchers, vireos, crows, swallows, chickadees, nuthatches, wrens, thrushes, warblers, sparrows, tanagers, grosbeaks, blackbirds, and finches) and near passerines (e.g., pigeons, doves, cuckoos, owls, nightjars, swifts, hummingbirds, kingfishers, and woodpeckers) encompass the majority of land bird species. Many species are neotropical migrants that use a variety of nesting habitats in North America and winter in the Caribbean, and Central and South America. As with shorebirds, the northern Gulf Coast is an important stopover for migrating passerines and near passerines providing resting and foraging habitat. In addition, some land bird species may overwinter along the Gulf Coast and many species are also year-round residents.

Table 12-10 provides a summary of the different migratory bird groups specifically addressed by the USFWS review and summarizes the potential impacts to these groups and associated habitats that could result from the implementation of this project.

Table 12-10. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, roosting, nesting	Seabirds forage in water, rest, or nest in terrestrial habitats, both in the general vicinity of the project area. However, the project will take in-water and most roosting/nesting occurs in the dune habitat. The level of project activity in open water is unlikely to startle nesting or resting birds due to distance from terrestrial habitats and activities will occur during the day only so roosting should not be impacted. Seabirds could be feeding in the area; however, they would likely move from the area of construction due to disturbance.
Shorebirds (e.g., piping plover, red knot)	Foraging, feeding, resting, nesting	Shorebirds forage, feed, and rest, and in the types of habitats consistent with some of the shoreline areas near the proposed location of the living shoreline breakwaters As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. No nesting habitat is thought to be present. If any nesting is observed conservation measures will be implemented.

Essential Fish Habitat

The 1996 Magnuson-Stevens Act, as amended, requires cooperation among NMFS and federal and state agencies to protect, conserve, and enhance Essential Fish Habitat (EFH). EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. The designation and conservation of EFH seek to minimize adverse impacts on habitat caused by fishing and non-fishing activities. NOAA's Estuarine Living Marine Resources Program developed a database on the distribution, relative abundance, and life history characteristics of ecologically and economically important fishes and invertebrates in the nation's estuaries. NOAA has designated EFH for more than 30 estuaries in the northern Gulf of Mexico for a number of species of finfish and shellfish. All of Pensacola Bay and waters

surrounding Gulf Island National Seashore are designated as EFH. EFH in Pensacola Bay provides habitat for several species of fish and shellfish (Table 12-11).

The EFH within the project area include emergent wetlands, mud substrate, and estuarine water columns for species of fish, such as red drum brown shrimp, pink shrimp, and white shrimp. The area also provides habitat for prey species (e.g. Gulf menhaden, shad, croaker and spot) that are consumed by larger commercially important species. In addition, the area provides habitat for spotted seatrout, striped mullet, southern flounder, Atlantic croaker, and Gulf menhaden. EFH consists of the following waters and substrate areas in the Gulf of Mexico:

- Red Drum FMP: All estuaries; Vermilion Bay, Louisiana, to the eastern edge of Mobile Bay, Alabama, to depths of 25 fathoms; Crystal River to Naples, Florida, between depths of 5 and 10 fathoms; and Cape Sable, Florida, to the boundary between the areas covered by the GMFMC and the South Atlantic Fishery Management Council (SAFMC) between depths of 5 and 10 fathoms.
- Coastal Migratory Pelagics FMP: All estuaries; the U.S./Mexico border to the boundary between the areas covered by the GMFMC and the SAFMC, from estuarine waters to depths of 100 fathoms.
- Shrimp FMP: All estuaries; the U.S./Mexico border to Fort Walton Beach, Florida, from estuarine waters to depths of 100 fathoms; Grand Isle, Louisiana, to Pensacola Bay, Florida, between depths of 100 and 325 fathoms; Pensacola Bay, Florida, to the boundary between the areas covered by the GMFMC and the SAFMC to depths of 35 fathoms, with the exception of waters extending from Crystal River to Naples, Florida, (GMFMC 2005:15) between depths of 10 and 25 fathoms and in Florida Bay between depths of 5 and 10 fathoms.
- Reef Fish FMP: EFH for reef fish consists of Gulf of Mexico waters and substrates extending from the U.S./Mexico border to the boundary between the areas covered by the GMFMC and the SAFMC, from estuarine waters to depths of 100 fathoms.
- Highly Migratory Species FMP: Highly migratory species (HMS) are managed by the Secretary of Commerce, NMFS and defined to be tuna species, marlin (*Tetrapturus spp*. and *Makaira spp*.), oceanic sharks, sailfishes (*Istiophorus spp*.), and swordfish (*Xiphias gladius*). HMS may be found in large expanses of the world's oceans, straddling jurisdictional boundaries. Identifying EFH for tuna, swordfish and many pelagic shark species is challenging because, although some HMS may frequent the neritic waters of the continental shelf as well as inshore areas, they are primarily blue-water (i.e., open-ocean) species. Their distributions are usually not correlated with the areas or features such as bottom sediment type or vegetative density, but are often associated with physiographic structures of the water column. Distribution of juveniles, adults, and especially early life stages (larvae for tuna and swordfish; neonates for sharks) may also be constrained by tolerance of temperature, salinity or oxygen levels. These physicochemical properties may be used to define the boundaries of essential habitat in a broad sense.

EFH occurs for several species of fish and shellfish in and around project area and is identified in Table 12-11 for key species that occur in Pensacola Bay.

Table 12-11. Essential fish habitat for key species that occur in the project area.

SPECIES/MANAGEMENT UNIT	LIFESTAGE(S) FOUND AT LOCATION	FISHERY MANAGEMENT PLAN
Sandbar Shark	Neonate	Highly Migratory Species
Red Drum	ALL	Red Drum
Scalloped Hammerhead Shark	Neonate	Highly Migratory Species
Tiger Shark	Neonate Juvenile	Highly Migratory Species
Atlantic Sharpnose Shark	Neonate	Highly Migratory Species
Shrimp (4 Species) Brown shrimp (*Farfantepenaeus aztecus*) White shrimp (*Litopenaeus setiferus*) Pink shrimp (*Farfantepenaeus duorarum*) Royal red shrimp (*Pleoticus robustus*)	ALL	Shrimp
Coastal Migratory Pelagics	ALL	Coastal Migratory Pelagics
Reef Fish (43 Species) **Balistidae - Triggerfishes** Gray triggerfish (*Balistes capriscus*) **Carangidae - Jacks** Greater amberjack (*Seriola dumerili*) Lesser amberjack (*Seriola fasciata*) Almaco jack (*Seriola rivoliana*) Banded rudderfish (*Seriola zonata*) **Labridae - Wrasses** Hogfish (*Lachnolaimus maximus*) **Lutjanidae - Snappers** Queen snapper (*Etelis oculatus*) Mutton snapper (*Lutjanus analis*) Blackfin snapper (*Lutjanus buccanella*) Red snapper (*Lutjanus campechanus*) Cubera snapper (*Lutjanus cyanopterus*) Gray (mangrove) snapper (*Lutjanus griseus*) Lane snapper (*Lutjanus synagris*) Silk snapper (*Lutjanus vivanus*) Yellowtail snapper (*Ocyurus chrysurus*) Wenchman (*Pristipomoides aquilonaris*) Vermilion snapper (*Rhomboplites aurorubens*) **Malacanthidae - Tilefishes** Goldface tilefish (*Caulolatilus chrysops*) Blueline tilefish (*Caulolatilus microps*) (Golden) Tilefish (*Lopholatilus chamaeleonticeps*) **Serranidae - Groupers** Speckled hind (*Epinephelus drummondhayi*) Yellowedge grouper (*Epinephelus flavolimbatus*) Red hind (*Epinephelus guttatus*) Goliath grouper (*Epinephelus itajara*) Red grouper (*Epinephelus morio*) Warsaw grouper (*Epinephelus nigritus*) Snowy grouper (*Epinephelus niveatus*) Nassau grouper (*Epinephelus striatus*) Marbled grouper (*Epinephelus inermis*) Black grouper (*Mycteroperca bonaci*) Yellowmouth grouper (*Mycteroperca interstitialis*) Gag (*Mycteroperca microlepis*) Scamp (*Mycteroperca phenax*) Yellowfin grouper (*Mycteroperca venenosa*)	ALL	Reef Fish

Environmental Consequences for Protected Species

12.9.5.7 Sea Turtles

Impacts on sea turtles include the risk of harm from construction activities, including physical impacts from construction materials or operating construction machinery. Due to these species' mobility and the implementation of measures including NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions (2006) and Measures for Reducing Entrapment Risk to Protected Species (2012)*, the risk of impacts from construction would be minimal. Sea turtles may be affected by being temporarily unable to use a project site due to potential avoidance of construction activities and related noise, but these impacts would be short term and minor.

Sea turtles do not nest and are not likely to forage within the project site given the shallow water depths and sand substrate. Due to a lack of seagrasses and other suitable sea turtle foraging habitat, impacts from project installation and short-term turbidity would be short term and mior for sea turtles that may occur within the project area. Additionally, any impacts would be short term and minor given the small footprint and short duration of the proposed project activities in relation to similar adjacent habitats available for foraging.

12.9.5.8 Marine Mammals

Noise and other activity associated with proposed construction may temporarily disturb certain dolphin species in the vicinity of the project area through temporary impacts on prey abundance, water quality (turbidity), and underwater noise, and may temporarily increase the potential for boat collisions with certain species in the project area during construction. West Indian Manatee

West Indian manatees may be occasionally found in the shallow waters of the project area during the warmer months of the year. Given their slow-moving and low visibility nature, it is possible that manatees could wander into proximity of construction activities.

The Trustees evaluated the potential for take of Marine Mammals under the MMPA and due to these species' mobility and the implementation of NMFS' Sea Turtle and Smalltooth Sawfish Construction Conditions, NMFS' Measures for Reducing Entrapment Risk to Protected Species (2012), Standard Manatee Conditions for In-Water Work (USFWS 2011), and USFWS recommended conservation measures for listed species and other trust resources, take of marine mammals under the MMPA is not anticipated.

Gulf Sturgeon

The Gulf sturgeon critical habitat Unit 9 primary constituent elements (PCE's) include: water quality, safe and unobstructed migratory pathways, sediment quality, and abundant prey items. Water quality impacts from project activities are expected to be minimal and temporary because increases in water turbidity would be reduced through the use of BMPs described in the Construction and Installation section. There is no indication of sediment contamination within the project area and the proposed conversion of habitat is not expected to reduce the PCE's ability within Unit 9 to support Gulf sturgeon conservation because of the small overall footprint for breakwater construction (5.05 acres), the rapid recovery of forage species that may be affected due to construction, and the availability of more suitable Gulf sturgeon migratory and foraging areas within Pensacola Bay. Potential adverse impacts on Gulf sturgeon include the risk of harm from construction activities, which would be minimal due to the species' mobility and the implementation of BMPs including NMFS' *Sea Turtle and Smalltooth Sawfish*

Construction Conditions which are protective of Gulf sturgeon. Some sandy bottom habitat would be converted to hard bottom (breakwater construction) as described above and, prey is not expected to be limiting from project implementation

The creation of a reef may provide an indirect benefit to Gulf sturgeon by enhancing the diversity of prey available to Gulf sturgeon by creating patchwork reefs that, over time, provide more structurally complex habitat for prey species. The use of breakwaters to create reefs, while reducing shoreline erosion, also encourages nektonic production that could lead to greater prey availability in the immediate surroundings for Gulf sturgeon.

There is a risk of direct impacts to Gulf Sturgeon resulting from the proposed dredging activities for marsh creation; however, these would be confined to direct impacts associated with the dredge equipment. To avoid potential impacts to protected species, the proposed project would not use a hopper dredge unless required due to site conditions at the selected source sites. Marsh creation may also benefit Gulf Sturgeon by increasing prey abundance in adjacent areas.

12.9.5.9 Saltmarsh Topminnow

Suitable habitat for saltmarsh topminnow is restricted to salt marshes; the species also spawns in upper marshes during the highest tides. Additionally, saltmarsh topminnow does not disperse widely from suitable habitat. The proposed activities would not impact suitable habitat for saltmarsh topminnow and therefore no mpacts are anticipated.

12.9.5.10 Smalltooth Sawfish

Smalltooth sawfish historically were found in and around the project area; however, the current distribution is mainly restricted to South Florida and the Keys. Critical habitat for the smalltooth sawfish lies between Charlotte Harbor and the Florida Everglades, outside and south of this project site; therefore no impacts are anticipated (NOAA 2009c).

12.9.5.11 Protected Bird Species

The upland habitat located within the project area is best described as landscaped parklands. The habitat quality is very low given the high level of human use and the landscaped nature of the vegetation. Additionally, the shorelines are predominately altered through the use of concrete seawalls with granite rip-rap boulders. This limits the available natural shoreline for wading bird foraging habitat.

Potential impacts for birds would include noise and other disturbance from construction activities that may impact birds using open water and nearby shoreline within the project area. These impacts would be minor and short term in scope. A small number of bird species protected under the Migratory Bird Treaty Act may nest near or within the project area; however, bird monitoring by FDEP indicate that the Project Greenshores area is used during migration and as winter habitat. Therefore, disturbance to nesting birds from proposed project activities is not anticipated. Short term minor impacts to prey resources may occur during construction; however these impacts would be local in scope. Potential short term, minor impacts for birds would be outweighed by the expected habitat and water quality benefits of restoration at the project site.

To reduce the risk of impacts to migratory bird species, a pre-construction bird survey would be conducted during the nesting season and within 300 ft of the construction activities. If nests are

observed prior to construction, the USFWS would be contacted to assist with specific conservation measures to avoid impacts. Pre-construction surveys would include bald eagle nests. If a bald eagle nest is located, best management practices provided by the USFWS and State of Florida would be followed to avoid disturbance.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in**Error! Reference source not found.**.

Table 12-12. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care will be taken to minimize noise and physical disruptions (e.g., vibration) near areas where foraging or resting birds are encountered. All disturbances will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity, which they will have. Roosting should not be impacted because the project will occur during daylight hours only. Nesting should not be impacted because the project will not occur near nesting habitats.
Shorebirds (e.g., piping plover, red knot)	If the project will be implemented during shorebird nesting season, areas that could be affected by project noise will be examined for nesting shorebirds or evidence of nesting shorebirds. If nesting or evidence of nesting is observed, the most recent version of the Florida Fish and Wildlife Conservation Commission's (FWC) standard guidelines to protect against impacts to nesting shorebirds will be obtained and followed. Among other elements these guidelines note that: - driving on the beach for construction shall be limited to the minimum necessary within the designated travel corridor, which will be established just above or just below the primary "wrack" line. - Predator-proof trash receptacles shall be installed and maintained during construction at all beach access points used for the project construction to minimize the potential for attracting predators of migratory birds. - Workers shall be briefed on the importance of not littering and keeping the project area trash and debris free. - Educational signs shall be installed at public access points within the project area with emphasis on the importance of the beach habitat and wrack line for migratory birds. - When the project area has a pet or dog regulation, the provisions of the regulation shall be included on the educational signs.

12.9.5.12 Essential Fish Habitat (EFH)

The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. The habitat in the project area includes the lower Pensacola Bay and Gulf of Mexico waters and consists primarily of sandy substrate consistent with sediment along the northern Gulf of Mexico. The proposed construction of a breakwater to create reef and salt marsh will enhance and restore marine habitat in areas that support EFH. Any disturbance to managed species and their prey using these habitats will be minor and very brief and the techniques to be employed will not result in any long-term adverse impacts to other EFH types. The anticipated long-term benefits to EFH, especially red drum, shrimp, and reef fish, include increased feeding, spawning, and nursery habitats and increased prey abundance.

Findings for Protected Species: Due to these species' mobility and the implementation of NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions*, NMFS' *Measures for Reducing Entrapment Risk*

to Protected Species (2012), Standard Manatee Conditions for In-Water Work (USFWS 2011), and USFWS recommended conservation measures for listed species and other trust resources, the risk of injury would be minimal to the protected species discussed above. Sea turtles, Florida manatees, Gulf sturgeon, and a small number of protected bird species may be affected by being temporarily unable to use the site due to avoidance of construction activities and related noise. Therefore, because of the mobility of these protected species, the small footprint for the proposed project, the short-term scope of the constructions activities, and best practices that would be implemented, as described above, the risk of injury or other potential adverse impacts are likely to be minor and short term. In addition, the benefits of habitat protection and restoration from the proposed project will increase benthic habitat diversity and restore salt marsh habitat, which would support a greater diversity and abundance of species.

The Trustees also evaluated the potential for take of Marine Mammals under the MMPA and due to these species' mobility and the implementation of NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006), NMFS' *Measures for Reducing Entrapment Risk to Protected Species* (NOAA,2012), *Standard Manatee Conditions for In-Water Work* (USFWS 2011), and USFWS recommended conservation measures for listed species and other trust resources, take of marine mammals under the MMPA is not anticipated.

Consultations with NMFS for Essential Fish Habitat and the Endangered Species Act have been completed (Fay, 2014). NMFS concurred that negative impacts to Essential Fish Habitat would be minor and brief and the overall project will enhance and restore marine habitats in areas supporting Essential Fish Habitat. Under the Endangered Species Act, NMFS concurred that the proposed project is not likely to adversely affect protected species, including sea turtles, Gulf Sturgeon, and Gulf Sturgeon critical habitat (Crabtree, 2014).

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On February 6, 2014 the review of potential impacts to species managed by USFWS was completed (Reynolds, 2014).The USFWS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect West Indian manatee, piping plover, or red knot (if listed). This review also concurred with the Trustees'conclusion the project would have no effect on five species of sea turtles in terrestrial habitats (green, hawksbill, Kemp's ridley, leatherback, and loggerhead).

Further, bald eagles are not present at the project location so will not be affected. At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

12.9.5.13 Marine and Estuarine Resources (benthic organisms, oysters, fish)

Affected Resources

In general, researchers have found relatively low overall biomass of infauna, epibenthic invertebrates, and fishes in the Pensacola Bay system (Livingston 1999). Benthic microalgae, microphytobenthos, periphyton, and biofilms communities in Pensacola Bay are dominated by Bacillariophyceae (Allison, 2000). In many estuaries, light limits production, but this is not the case in Pensacola Bay. Pensacola Bay has low turbidity and high light penetration indicating that primary production occurs through much of the water column and benthos (Murrell 2009). In fact, Allison (2000) found that the average photic

depth of Pensacola Bay is approximately 5 m, meaning that 78% of the bay could potentially support microphytobenthos production. However, Allison (2000) found that Pensacola Bay has relatively low overall productivity coupled with a relatively low benthic respiration rate, which they attribute to the proportionally large area of sandy sediments with low organic levels. Additionally, Collard (1989) suggests, based on his study of the benthic macroinvertebrates in the Pensacola estuarine system, that biological conditions are highly variable.

Oysters

The eastern oyster is the primary oyster species found in the Gulf and is the major commercial species. Oysters are important as both organisms and habitat with an integral role in the functioning of the ecosystem. The eastern oyster lives in shallow, well-mixed estuaries, lagoons, tidal sloughs of barrier islands, and oceanic bays. This species is found from 1 foot above the mean low tide line to 40 ft below the mean low tide line and within the Gulf of Mexico is typically found at depths of 0 to 13 ft (Eastern Oyster Biological Review Team 2007).

The eastern oyster feeds by filtering large quantities of water through their gills and each adult oyster can filter approximately 1.3 gallons of water per hour, effectively contributing to cleaning the water column (Berrigan et al. 1991). Within an oyster reef community, oysters are the dominant species, though over 300 other macrofauna species may be living on an oyster reef (Wells 1961). In addition to enhancing habitat, productivity, and biodiversity, oyster reefs provide benefits to the physical environment. Reefs act as natural breakwaters and attenuate wave energy which can stabilize and protect coastal habitats such as salt marshes and SAV, and prevent shoreline erosion (Grabowski and Peterson 2007; Coen et al. 2007; GSMFC 2012).

Historically, oysters were harvested from Pensacola Bay; landings in oysters peaked about 1970 (Macauley 2005). As much as 90% of the oyster population was lost to disease by 1971, and oyster beds are no longer commercially viable, although an oyster fishery still exists in the Pensacola bay System, accounting for 1.7% of the state's oyster landings (Livingston 2010). There are no areas classified for oyster harvest in the project area. Oyster reef restoration through Project GreenShores has successfully constructed breakwaters that now support species commonly found on oyster reefs. In 2003, Project GreenShores Phase I created approximately seven acre of oyster reefs adjacent to the proposed PGSII. In 2006, Project GreenShores Phase II constructed two breakwaters within the proposed PGSII; a subsequent survey by FDEP found that the PGSII structures are being colonized by invertebrate species.

Fish

More than 200 species of fish and shellfish have been reported in the estuarine waters of the Pensacola Bay system. Four anadromous fish are known to inhabit the river systems: Gulf sturgeon (A*. oxyrhynchus desotoi*), Alabama shad (*Alosa alabamae*), skipjack herring (*Alosa chrysochloris*), and striped bass (*Morone saxatilis*). Largemouth bass (*Micropterus salmoides*) and redear sunfish (*Lepomis microlophus*), which are tolerant of low salinity levels, often invade the streams and embayments in the river delta marshes. Other species native to the area include spot (*Leiostomus xanthurus*), bay anchovy (*Anchoa mitchilli*), Atlantic croaker (*Micropogonias undulatus*), spotted seatrout (*Cynoscion nebulosus*), longnose gar (*Lepisosteus osseus*), Gulf menhaden (*Brevoortia patronus*), channel catfish (*Ichthyomyzon punctatus*), striped mullet (*Mugil cephalus*), American eel (*Anguilla rostrata*), chain pickerel (*Esox niger*), golden shiner (*Notemigonus crysoleucas*), coastal shiner (*N. petersoni*), silver perch (*Bairdiella chrysura*), clown goby (*Microgobius gulosus*), darter goby (*Gobionellus boleosoma*), blue crab (*Callinectes sapidus*),

ghost crab (*Ocypode quadrata*), American oyster (*Crassotrea virginica*), and Penaeid shrimp (*Penaeus spp*.). The dominant epibenthic macroinvertebrates include brown shrimp (*Penaeus aztecus*) and blue crabs (*Callinnectus sapidus*) (Livingston 1999).

Pensacola Bay has been affected by anthropogenic impacts that have exposed fish communities to a variety of contaminants from multiple sources. During the demolition of the I-10 Bridge, fish were collected and samples tested for trace metals, dioxins/ furans and poly-carbonated biphenyls (PCB's) (Mohrherr et al. 2009). Eight of the samples exceeded U.S. EPA standards, with the highest being in mullet (Mohrherr et al. 2009). Additional fish community data were collected by Stevenson (2007) on Pensacola Bay at two study sites inProject Greenshores Sites I and II. Four fish were continually the most abundant: striped mullet (*Mugil cephalus*), tidewater silverside (*Menidia peninsulae*), spot, and pinfish (*Lagodon rhomboids*). Out of 34 species caught, the remaining species made up just 5% of the overall catch (Stevenson 2007).

Environmental Consequences

Potential impacts to benthic organisms, oysters, and fish may occur during construction activities; however these impacts would be short term and localized. Disturbance of individual species would occur; however, there would be no change in the diversity or local populations of marine and estuarine species. Any disturbance would not interfere with key behaviors such feeding and spawning. There would be no restriction of movements daily or seasonally.

Wildlife and Wildlife Habitat

Impacts to native species, their habitats (including Essential Fish Habitat), or the natural processes sustaining them may be detectable, but localized and would not measurably alter natural conditions. Infrequent responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, resting, migrating, or other factors affecting population levels. Small changes to local population numbers, population structure, and other demographic factors are not likely to occur. Sufficient habitat would remain functional at both the local and range-wide scales to maintain the viability of the species. Overall, the net benefits of this habitat protection and restoration project outweigh any minor and temporary impact by increasing benthic habitat diversity, creating structural complexity for benthic habitat, and restoring salt marsh which would support a greater diversity and abundance of marine species.

Findings for Marine and Estuarine Resources: The proposed project may result in short-term, minor adverse impacts to oysters and some species of fish within the project area due to construction activities and increased noise. However, due to the small proposed footprint and availability of sufficient habitat within the project area, there would not be long-term adverse impacts to marine and estuarine resources. Long term moderate beneficial impacts are expected due to creation of hard reef structure since the reef structure would increase the abundance of fish, crabs, and shellfish species.

12.9.5.14 Introduce or Promote Non-native Species

Affected Resources

Non-native invasive species have the ability to alter the existing terrestrial or aquatic ecosystem within, and possible expand out into adjacent areas after the initial introduction. The invasive species threat, once realized, could result in economic damages. Prevention is ecologically responsible and

economically sound. Chapter 3 described more about the regulations addressing invasive species, pathways, impacts, and prevention.

Environmental Consequences

No impacts related to introduced or non-native species are expected due to the proposed project. The project would construct breakwater structures to support oyster settlement and restoration to Pensacola Bay where oysters were historically present. Creation of marsh habitat would also involve the use of native marsh species and follow strict protocol established by the state of Florida to ensure local sources of native species are used to create marsh habitat. Best Management Practices (BMPs) to control the spread of any invasive species present, and prevent the introduction of new invasive species due to the project will be implemented. In general, best management practices would primarily address risk associated with vectors (e.g., construction equipment, personal protective equipment, delivery services, foot traffic, vehicles/ vessels, shipping material). There are many resources that provide procedures for disinfection, pest-free storage, monitoring methods, evaluation techniques, and general guidelines for integrated pest management that can be prescribed based upon specific site conditions and vectors anticipated. In addition, to best management practices, outreach and educational materials may be provided to project workers and potential users/visitors. Other measures that could be implemented are identified in the Chapter 6 Appendix. Due to the implementation of BMPs, the Trusteesexpect impacts due to invasive species introduction and spread to be short term and minor.

12.9.5.15 Human Uses and Socioeconomics

12.9.5.15.1 Socioeconomics and Environmental Justice

Affected Resources

The population of Escambia County is 297,688 (U.S. Census 2010). The project is contained within Census Tracts 3 and 8 in Escambia County. Table 12-13 population/minority data for Census Tract 3, Census Tract 8, Escambia County, and Florida.

Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, was signed in 1994. The Executive Order and accompanying Presidential Memorandum focus Federal attention on the environmental and human health conditions in minority and low-income communities, enhances efforts to assure nondiscrimination in Federal programs affecting human health and the environment, and promotes meaningful opportunities for access to public information and for public participation in matters relating to minority and low-income communities and their environment.

Based on 2010 Census blockgroup data, the PGS II site is located near communities with a minority population between 10-20% and 16.5% of the population living below poverty (USEPA 2013a). The Sanders Beach site is located near communities with a minority population between 40-100% and 23.6% of the population living below poverty (U.S. EPA 2013a) (Figure 12-11 andFigure 12-12). In direct vicinity of the project site, the submerged lands are owned by the City of Pensacola. Proposed activities will take place within nearshore waters at both PGS II and Sanders Beach sites. Consequently, the proposed action will not directly influence any communities in close proximity to the shoreline.

Environmental Consequences

This project is not designed to create a benefit for any group or individual, but rather benefits on a local and regional basis. There are no indications that the proposed living shoreline project would be contrary to the goals of E.O. 12898, or would create disproportionate, adverse human health or environmental impacts on minority or low income populations of the surrounding community.

Table 12-13. Populations of Florida Escambia County, Census Tract 3, and Census Tract 8.

TOPIC	FLORIDA		ESCAMBIA COUNTY		CENSUS TRACT 3		CENSUS TRACT 8	
2010 Total Population	18,688,787		297,668		2,466		4,219	
White alone	14,270,053	76.4%	207,330	69.7%	1,340	54.3%	2,927	69.4%
Black or African American alone	2,946,899	15.8%	66,760	22.4%	909	36.9%	1,172	27.8%
American Indian and Alaska Native alone	58,192	0.3%	1,731	0.6%	0	0.0%	14	0.3%
Asian alone	455,403	2.4%	8,198	2.8%	0	0.0%	9	0.2%
Native Hawaiian and Other Pacific Islander alone	11,005	0.1%	547	0.2%	0	0.0%	0	0.0%
Some Other Race alone	564,351	3.0%	2,125	0.7%	0	0.0%	0	0.0%
Two or More Races:	382,884	2.0%	10,977	3.7%	217	8.8%	97	2.3%

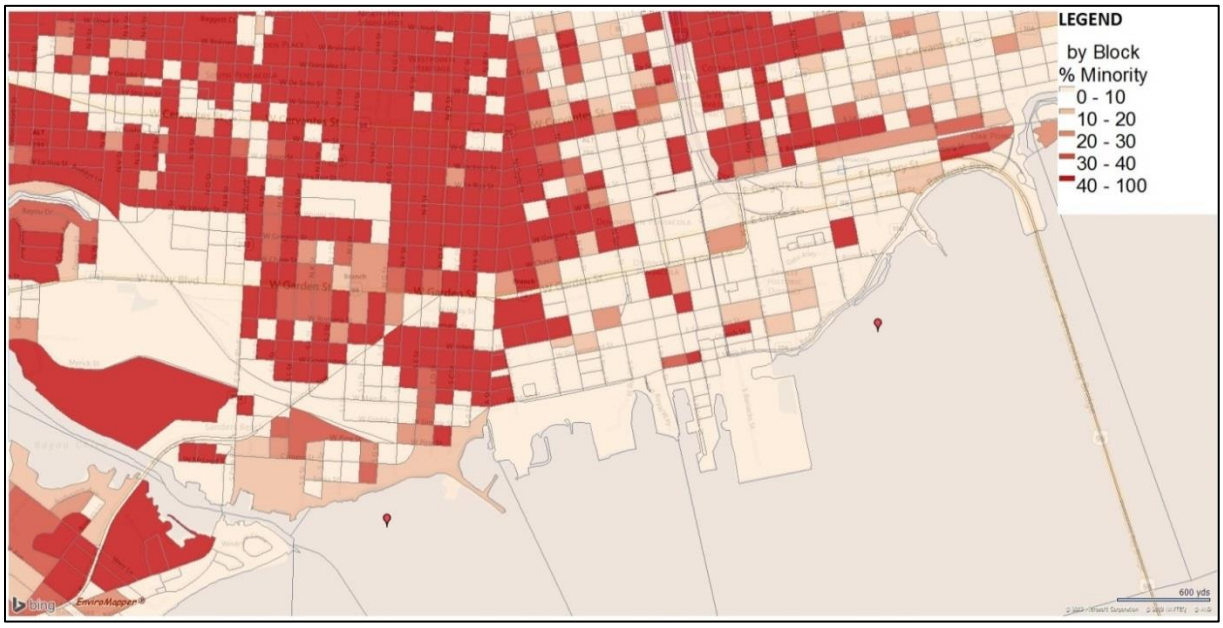

Figure 12-11. Percent minority population

Figure 12-12. Percent population living below poverty

Findings: It is expected that this project would have a short-term, minor, direct adverse impact through disruption of localized fishing during construction. However, direct, short-term, moderate benefits are expected through the creation of a small number of local construction jobs. Long-term, indirect, moderate benefits would result from increasing fisheries habitat, and recreational and fishing value of the area.

12.9.5.15.2 Cultural Resources

Affected Resources

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. The Florida Division of Historic Resources is the state agency responsible for cultural and historic resources and Section 106 consultations for project within the state. Previous consultations with the Florida Division of Historic Resources for Project Greenshores Phase II found that no significant archaeological or historical sites are recorded for, or likely to present within, the area of potential effect for the Project GreenShores living shorelines project implementation at Project Greenshores Phase II. There have not yet been similar reviews or cultural resource surveys conducted for the Sanders Beach site. Project information has been submitted to the Department of the Interior for coordination. While the Section 106 reviews process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Environmental Consequences

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

Finding: The proposed project is anticipated to have no impact on cultural resources in the area. A complete review of this project under Section 106 of the NHPA would be completed prior to any project project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area.

12.9.5.15.3 Infrastructure

Affected Resources

The landward sides of the proposed project areas are developed with a variety of infrastructure that includes shoreline protection, roads, parks, and residential development. The existing infrastructure within the project area is shown below (Figure 12-13, Pensacola Bay Living Shoreline Infrastructure Map from FDOT's Efficient Transportation Decision Making Environmental Screening Tool).

Environmental Consequences

All the construction activities are anticipated to be performed from water with no or limited activities on the shoreline adjacent to the site.

Findings: The project is anticipated to have no impact on infrastructure in the area.

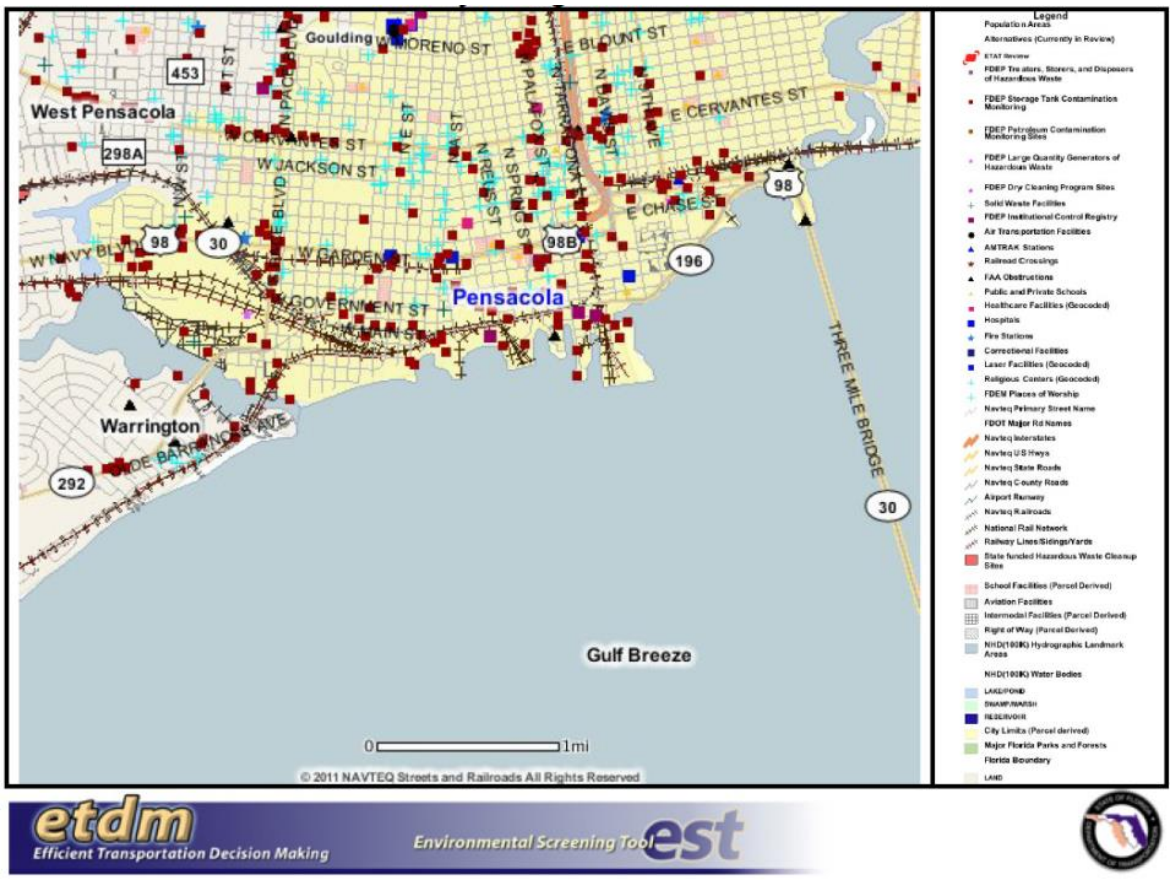

Figure 12-13. Pensacola Bay Living Shoreline Infrastructure.

12.9.5.15.4 Land and Marine Management

Affected Resources

Land and Marine Uses

The landward side of the proposed project have a variety of land uses that include recreational, commercial, residential land uses as well as publicly owned lands. Much of the land use in the project area is classified as developed. The existing land cover and land use within the project area is shown below (seeFigure 12-14).

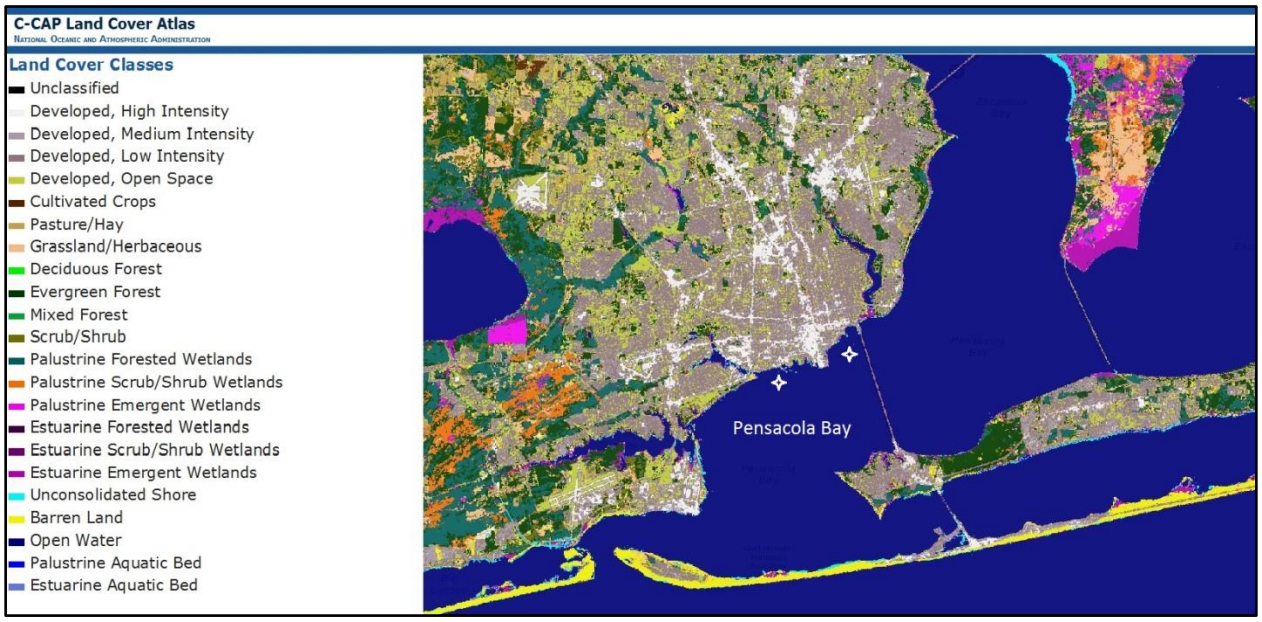

Figure 12-14. Pensacola Bay Living Shoreline Land Use Map.

Coastal Zone

The project is located in a coastal area regulated by the federal Coastal Zone Management Act (CZMA) of 1972 and the Florida Coastal Management Act of 1978.

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS (Federal Trustees 2013). The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process (Milligan 2014).

Environmental Consequences

Because the proposed activities focus on the marine environment, the management of adjacent land uses would not be affected. In addition, the project design will incorporate and accommodate existing marine uses within the area to prevent or minimize any potential impacts. Additionally, boating safety signs would be installed in the marine environment at the project site that would benefit marine management within the project site. Although no direct impacts are anticipated, indirect impacts may

occur within Florida's designated coastal zone. Therefore, the project would require a determination of whether the project is consistent with the CZMA.

Finding: The project is anticipated to have no impact on land use or marine management in the area.

12.9.5.15.5 Aesthetics and Visual Resources

Affected Resources

The landward side of the proposed project has a variety of land uses that provide access for residents, visitors, and commuters.

Environmental Consequences

Aesthetics would be reduced in the project area during the construction operations, due to the physical presence of the equipment used to transport the material as well as the presence of other land- based support equipment. However, these impacts would be minor, direct, temporary impacts. Following construction, the increased habitat would provide for minor, direct improved aesthetics impacts.

Findings: The proposed action would result in minor, short term visual impacts while construction equipment is used at the project site. The placement of these navigational signs would result in a direct, long term, minor adverse impact on the aesthetics and visual resources of the area.

12.9.5.15.6 Tourism and Recreational Use

Affected Resources

The affected recreational resources include the waters along the Pensacola Bay shoreline. These resources are used primarily by local communities for recreational boating, fishing, and bird watching. Veterans Memorial Park and William Bartram Memorial Park, passive recreational use parks, are located adjacent to the shoreline near PGS II. The Sanders Beach-Corinne Jones Community Center and park with a small boat launch are located adjacent to the Sanders Beach site. In addition, the Pensacola Yacht Club, a privately owned marina, is located near the mouth of Bayou Chico adjacent to the Sanders Beach site. Several additional small marinas are found in Bayou Chico.

Environmental Consequences

For a short time, the construction process may limit the recreational activities, especially near the construction areas. In addition, there is the potential to affect some forms of recreational boating in shallow water areas near Sanders Beach by the placement of breakwaters. Shallow waters near the shoreline of Sanders Beach are currently used for instructional classes on sailing. The placement of breakwaters would limit the use of waters for this purpose at the placement site. Other shallow water boating uses such as canoeing or kayak would not be limited. The Sanders Beach area contains several shallow water areas; therefore, the overall capacity of this area to support recreational boating would not be significantly reduced. However, the project design process will evaluate potential conflicts with recreational boating uses and design options to minimize those conflicts.Boating safety signage would also be installed during and after the construction process to warn boaters of the breakwater locations. Once completed, the project would result in positive impacts at both Sanders Beach and PGS II by providing greater recreational uses for the project areas, due to improved fish and wildlife habitat.

Findings: The proposed project would have a short term, adverse impact to recreational use of the area during construction since the area would be avoided by recreational boaters. There may be long-term minor impacts to recreational boating in shallow waters at Sanders Beach; however, these impacts would be avoided or minimized during the final design process. The action would result in a minor beneficial effect on recreational use due to an anticipated increase fishing use of created reefs. The project would not result in adverse or beneficial long term indirect impacts to recreational use.

12.9.5.15.7 Public Health and Safety and Shoreline Protection

Affected Resources

Several areas within Pensacola Bay have experienced past shoreline erosion resulting in protection efforts using hardened structures, especially along urban and suburban areas. The shoreline adjacent to the proposed project sites is predominately hardened with concrete seawalls and granite riprap.

The management of hazardous materials is regulated under various federal and state environmental and transportation laws and regulations, including the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Emergency Planning and Community Right-to-Know Act; and the Hazardous Materials Transportation Act. The purpose of the regulatory requirements set forth under these laws is to ensure the protection of human health and the environment through proper management (identification, use, storage, treatment, transport, and disposal) of these materials. Some of these laws provide for the investigation and cleanup of sites that have already been contaminated by releases of hazardous materials, wastes, or substances.

A review of the EPA's EnviroMapper identifies several facilities adjacent to Pensacola Bay that report discharges or hazardous waste generation or disposal to the USEPA and one CERCLA site near the proposed project area, American Creosote Works (USEPA 2013b). The American Creosote Works, Inc. (ACW) Site is an 18 acre site located on 1800 West Gimble Street in a commercial and residential district of Pensacola, Florida. Operators sent process wastewaters to four holding ponds located in the western portion of the site. The ponds overflowed after heavy rains. Prior to 1970, wastewater in these ponds overflowed through a spillway into local streets and storm drains and Bayou Chico and Pensacola Bay. In later years, the company collected and spread liquid wastes on the ground in designated "Spillage Areas" on site. In 1983, EPA listed the site on the NPL. Site investigations found contamination in soil, sediment and ground water that could potentially harm people in the area. Contaminants of concern include volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), PCP and dioxin. EPA leads site investigation and cleanup activities in cooperation with FDEP.

Site investigations and cleanup activities have focused on three areas, which EPA refers to as operable units, or OUs. These areas include OU-1: surface and below-ground soil and sediment; OU-2: ground water; and OU-3: off-site dioxin-impacted soil. EPA has conducted several actions on and off the ACW property since 1983. The OU-1 cleanup is not yet complete. In 2003, EPA moved contaminated soils from surrounding residential areas onto the site and covered the soil with a temporary cap. However, EPA has not installed a final, permanent site-wide cap. A system of ground water monitoring and recovery wells were installed for OU-2. A Focused Feasibility Study report by EPA and FDEP addresses proposed plans for OU-3 to address off-site impacted soil (USEPA 2013c). EPA completed the last Five-Year Review in 2011 and plans to complete the next Five-Year Review in 2016.

EPA has worked with the community and its state partner to develop a long-term cleanup plan for the site, reflecting the Agency's commitment to safe, healthy communities and environmental protection. Community engagement and public outreach are core components of EPA program activities. EPA has conducted a range of community involvement activities to solicit community input and to make sure the public remains informed about site activities throughout the cleanup process. Outreach efforts have included fact sheets, public notices and information meetings. The site also has a Community Advisory Group. The Community Advisory Group has been meeting since the early 2000s. While the site is currently vacant, the community has developed reuse plans. These plans, updated over time in coordination with the site's cleanup, call for recreational and other land uses at the site in the future. The community last updated the site's reuse plan in 2010 (USEPA 2013c).

Environmental Consequences

The project is anticipated to have no environmental impacts on public health and safety in the area. Proposed construction activities would not disturb existing contaminated or remediated areas. In addition, sediment testing would be conducted to ensure that suitable, non-contaminated sources for dredge sediments are used during salt marsh creation. The placement of breakwaters and creation of salt marsh habitat at the proposed sites would improve shoreline protection for the area by reducing the energy of waves before they reach the shoreline.

Findings: This proposed project would not impact existing hazardous or contaminated sites adjacent to the project area or public health. There would be long term, moderate beneficial impacts to shoreline protection.

12.9.6 Summary and Next Steps

The proposed Florida Pensacola Bay Living Shoreline Project is intended to employ living shoreline techniques that utilize natural and/or artificial breakwater material to reduce shoreline erosion and provide habitat at sites within Pensacola Bay, Florida. Combining these objectives, this project would create reefs to reduce wave energy, increase benthic secondary productivity, and create salt marsh habitat. Proposed activities include completing and expanding an existing breakwater at the Project GreenShores Site II, constructing up to approximately 2,400 feet of breakwater at the Sanders Beach site, and creating salt marsh habitat at both sites. In total, approximately 18.8 acres of salt marsh habitat and 4 acres of reefs would be constructed. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would provide long-term benefits by creation of approximately 18.8 acre of salt marsh, and approximately 4 acres of reefs. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

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12.10 Florida Seagrass Recovery Project: Project Description

12.10.1 Project Summary

The proposed Florida Seagrass Recovery project will address boat damage to shallow seagrass beds in the Florida panhandle by restoring scars located primarily in turtle grass (Thalassia testudinum) habitats located in St. Joseph Bay Aquatic Preserve in Gulf County, with additional potential sites in Alligator Harbor Aquatic Preserve in Franklin County, and St. Andrews Aquatic Preserve, in Bay County. A boater outreach and education component of the project will install non-regulatory Shallow Seagrass Area signage, update existing signage and buoys where applicable, and install educational signage and provide educational brochures about best practices for protecting seagrass habitats at popular boat ramps in St. Joseph Bay, Alligator Harbor, and St. Andrews Bay. The total estimated cost for this project is $2,691,867.

12.10.2 Background and Project Description

The Trustees propose to address boat damage to shallow seagrass beds in the Florida panhandle by restoring scars located primarily in turtle grass (*Thalassia testudinum)* habitats. Scars are made when boat propellers cut up roots, stems, and leaves of seagrasses, producing long, narrow furrows devoid of vegetation. Turtle grass is a commonly-found species of submerged aquatic vegetation (SAV) in the panhandle that is particularly slow to rejuvenate naturally when injured. Turtle grass with propeller damage can take many years to rejuvenate, or in severely scarred areas may never completely recover.

The project will primarily be located in St. Joseph Bay Aquatic Preserve in Gulf County, with additional potential sites in Alligator Harbor Aquatic Preserve in Franklin County, and St. Andrews Aquatic Preserve, in Bay County (see Figure 12-15 for project location). These three Aquatic Preserves contain critical turtle grass habitat that, if not restored, will continue to erode and destroy more of the healthy habitat surrounding the injured areas

The objective of the proposed Florida Seagrass Recovery project is to restore submerged aquatic vegetation by addressing boat scars in aquatic preserves. The restoration work proposed includes surveying and mapping scarring within the seagrass habitats in the three Aquatic Preserves. Additionally, sediment tubes will then be manufactured, filled with local fine grain sediment, and deployed in approximately 2 acres of seagrass propeller scars. The tubes, which are made of biodegradable cotton fabric filled with sediment, would then be placed into propeller scars to enhance seagrass recovery by raising the propeller scar elevation to ambient grade with clean sediment of appropriate grain size, thereby offering suitable habitat for seagrass recruitment. Seagrass planting units would be installed in the sediment tubes after a 90-day curing period if necessary. This restoration would be facilitated by placing bird stakes in the restoration project area. The stakes would attract birds who then would supply natural fertilizer to the restoration area in the form of feces, which are rich in phosphorus and nitrogen.

Finally, a boater outreach and education component of the project would install non-regulatory *Shallow Seagrass Area* signage, update existing signage and buoys where applicable, and install educational signage and provide educational brochures about best practices for protecting seagrass habitats at popular boat ramps in St. Joseph Bay, Alligator Harbor, and St. Andrews Bay.

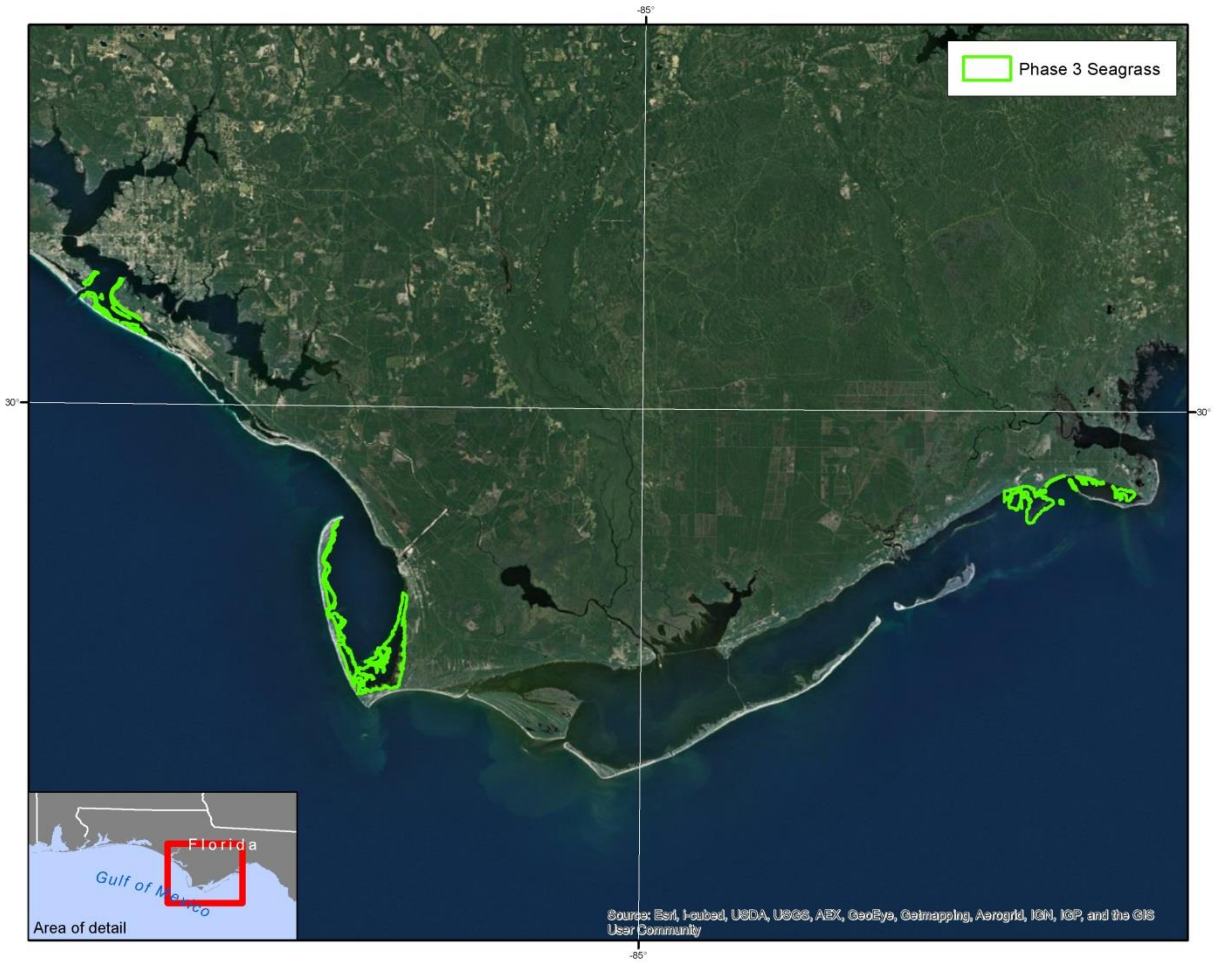

Figure 12-15. Location of envisioned Florida Seagrass Recovery Project.

12.10.3 Evaluation Criteria

This proposed project satisfies the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and associated response activities, submerged aquatic vegetation in the Florida Panhandle suffered adverse physical impacts. The project seeks to restore injured submerged aquatic vegetation. The ecological benefits that would be gained by this restoration project are anticipated to help compensate the public for Spill-related injuries and losses to submerged aquatic vegetation. Thus, nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

The project is technically feasible and utilizes proven techniques with established methods and documented results. Florida agencies have successfully completed projects of similar scope throughout Florida over many years. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Furthermore, the cost estimates are based on similar past projects, therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.10, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.10 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). This project is consistent with all three Aquatic Preserve management plans which are approved by the State of Florida. Therefore, this project is consistent with the long-term restoration needs of the State of Florida. See Section 6d of the Framework Agreement.

Many ecological projects, including ones similar to this project, were submitted as a restoration project on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Florida Seagrass Recovery Project also meets the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by response and SCAT activities for the Spill.

12.10.4 Performance Criteria, Monitoring and Maintenance

As part of the project costs, monitoring would be conducted to ensure project designs were correctly implemented and to evaluate project effectiveness. Performance criteria would be used to determine project success or the need for corrective actions. The monitoring has been designed around the project objective, which is to restore injured submerged aquatic vegetation. Specific success criteria includes: the creation of new submerged aquatic vegetation in previously scarred areas that meets project design criteria and is sustained for the expected life of the project.

Post construction performance monitoring would initially focus on plant survival and revegetation of the existing scars. This monitoring may include collection of habitat information such as the depth of the scar at different points in time, and percent vegetative cover of the scar. Additional information collected may include utilization and integrity of the bird stakes over time and nature and extent of any subsequent seagrass habitat scaring in areas where the new non-regulatory buoys are placed.

Pre- and post-project monitoring could compare restoration progress in both control and study areas. Changes in the number, length, and cover of propeller scars would be determined in large replicate photograph plots within each study area. Aerial photography may be performed annually, in late summer. Data layers would be created using ArcMap to determine the increase or decrease in scar number, length, and area over time.

Field surveys would be performed biannually in the early spring and late summer to monitor the progress of the restoration activities. Methods designed to measure percent-cover and shoot counts would be used to compare recovery rates of prop scars located within treated and untreated locations

of the project area. Permanent (fixed) transects would be incorporated into the study in order to monitor changes in the number of untreated prop scars. Underwater photographs and video may also be taken to document site characteristics prior to and following restoration efforts.

The Aquatic Preserve staff at each potential location would be responsible for maintenance of the project after the initial 3 year monitoring of the project

12.10.5 Offsets

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Habitat Equivalency Analysis to estimate appropriate Offsets for the Florida Seagrass Recovery Project. Habitat Offsets (expressed in DSAYs) were estimated for seagrass/submerged aquatic vegetationhabitat enhanced by this restoration, based on the expected spatial extent, duration and degree of improvements attributable to the project. In estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, benefits of restoring seagrass habitat, the time period that it would take for restored habitat to provide different levels of ecological benefits, and estimated project life. The Trustees and BP agreed that if this restoration is selected for implementation, BP would receive Offsets of 17 DSAYs of submerged aquatic vegetation habitat in Florida, applicable to injuries to submerged aquatic vegetation habitat in Florida, as determined by the Trustees' total assessment of injury for the Spill.

In the event that the injury determination for submerged aquatic vegetation habitat in Florida is quantified in the Natural Resource Damages Assessment using a metric other than DSAYs of submerged aquatic vegetation habitat in Florida, the Trustees agree to translate the agreed upon NRD Offsets into a currency consistent with the metric used to characterize the injury to submerged aquatic vegetation habitat in Florida. Any necessary translation of the Offsets will rely on the data and methods developed for the assessment and authorized in 15 C.F.R. Sections 990, *et seq.*

These Offsets are reasonable for this resource and project.

12.10.6 Cost

The total estimated cost to implement this project is $2,691,867. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and potential contingencies.

12.11 Florida Seagrass Recovery Project: Environmental Review

The purpose of this project is to address boat damage to shallow seagrass beds in the Gulf of Mexico on the Florida panhandle by restoring propeller scars located primarily in turtlegrass (*Thalassia testudinum*) habitats. The goal of this project is to provide Early Restoration for seagrass habitat that was injured as a result of the *Deepwater Horizon* accident and oil spill response, as well as other activities. The recovery program and boater outreach would restore approximately 2 acres of propeller-scarred seagrass habitat in three designated Florida Aquatic Preserves.

12.11.1 Introduction and Background

The proposed project would address boat damage to shallow seagrass beds in the coastal Florida panhandle region by restoring propeller scars located in turtlegrass habitats. Scars are made when boat propellers cut up roots, stems, and leaves of seagrasses, producing long, narrow furrows devoid of vegetation. Turtlegrass is a commonly found species of submerged aquatic vegetation (SAV) in the panhandle that is particularly slow to rejuvenate naturally when injured. Turtlegrass with propeller damage can take many years to rejuvenate naturally when injured, or in severely scarred areas may never completely recover. The proposed project would primarily be located in St. Joseph Bay Aquatic Preserve, Gulf County. Two additional potential seagrass restoration sites have been identified in St. Andrews Bay Aquatic Preserve, Bay County, and Alligator Harbor Aquatic Preserve in Franklin County, Florida. These three Aquatic Preserves contain critical turtlegrass habitat that, if not restored, will continue to erode and potentially destroy surrounding healthy SAV habitat. Restoring damage to SAV habitat would enhance vital coastal ecosystems and the commercial and recreational industries dependent on them.

12.11.2 Project Location

The proposed project is located in the Gulf of Mexico coastal bays of the Florida panhandle region. Three specific areas are targeted for seagrass restoration: Primarily, St. Joseph Bay Aquatic Preserve, near Port St. Joe, Gulf County; and two additional sites as necessary: Alligator Harbor Aquatic Preserve, near Alligator Point, Franklin County; and St. Andrews Bay Aquatic Preserve, near Panama City, Bay County. Figure 12-16 and Figure 12-17 depict the proposed project areas.

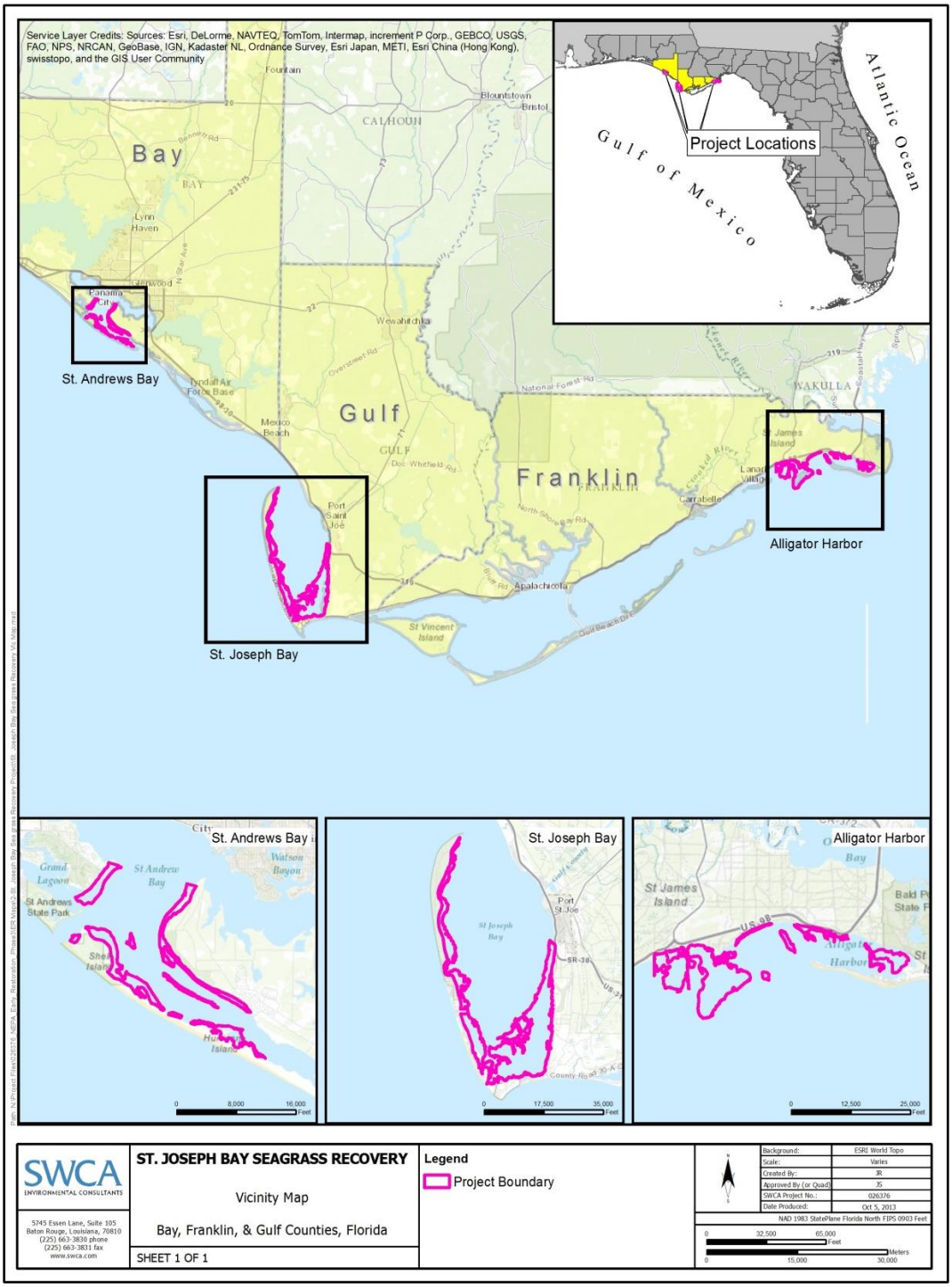

Figure 12-16. A vicinity map of the proposed project areas in Florida Aquatic Preserves in St. Joseph Bay, St. Andrews Bay, and Alligator Harbor.

Figure 12-17. Aerial map of the proposed project area in Florida Aquatic Preserves in St. Joseph Bay, St. Andrews Bay, and Alligator Harbor.

12.11.3 Construction and Installation

Proposed project construction and installation would involve three specific tasks: seagrass scar restoration, installation of bird stakes, and boater outreach and education programs. Detailed descriptions of each task are provided below.

12.11.3.1 Task 1: Seagrass Scar Restoration

Seagrass scarring in the three aquatic preserves would be surveyed and mapped. Sediment tubes would be acquired; filled with clean, local, appropriate sediment; and deployed in approximately 2 acres of seagrass propeller scars. The tubes are made of biodegradable cotton fabric filled with sediment, and would be placed into propeller scars to enhance seagrass recovery. The sediment tubes would raise the propeller scar elevation to ambient grade with clean, compatible sediment of appropriate grain size, thereby offering suitable habitat for natural seagrass recruitment into the damaged area. Sediment samples would be taken from the project area and analyzed prior to filling of the sediment tubes. Sediment that matches the profile of existing sediment would be acquired to fill the tubes. The sediment tubes would be filled on land with both hand-held and mechanical equipment, loaded onto vessels by mechanical equipment, and transported by vessel (such as pontoon boats) to the propeller scar locations in a manner that would avoid and minimize damage to existing seagrass habitat. Planting units would be installed in the sediment tubes if required after a 90-day curing period. Non-regulatory seagrass signs would be placed around the restoration area to prevent re-injury.

12.11.3.2 Task 2: Installation of Bird Stakes

Seagrass restoration would be facilitated by placing bird stakes in the restoration project area. The stakes would attract perching birds, which then supply natural fertilizer to the restoration area in the form of seabird feces. Bird feces are rich in phosphorus and nitrogen, which enhance seagrass growth.

The proposed bird stakes would be constructed of 1.5-inch-diameter polyvinyl chloride (PVC) pipe or similar material with wooden perches driven 2 to 3 feet into the sediment via hand-held sledgehammers or fencepost drivers from small, shallow draft vessels in such a way as to minimize bottom disturbance. The perches would remain 20 inches above mean high water elevation in water depths of less than or equal to 60 inches. The bird stakes would be installed as needed parallel to each scar. The stakes would be installed within 30 days of placement of sediment tubes, and would be removed upon successful establishment of the restored propeller scar.

12.11.3.3 Task 3: Boater Outreach and Education

The proposed boater outreach and education component of the project includes “shallow water seagrass area” signage (Figure 12-18), updating existing signage and buoys where applicable, and installing educational signage and providing educational brochures (Figure 12-19) about best practices for protecting seagrass habitats at popular boat ramps in St. Joseph Bay, Alligator Harbor, and St. Andrews Bay.

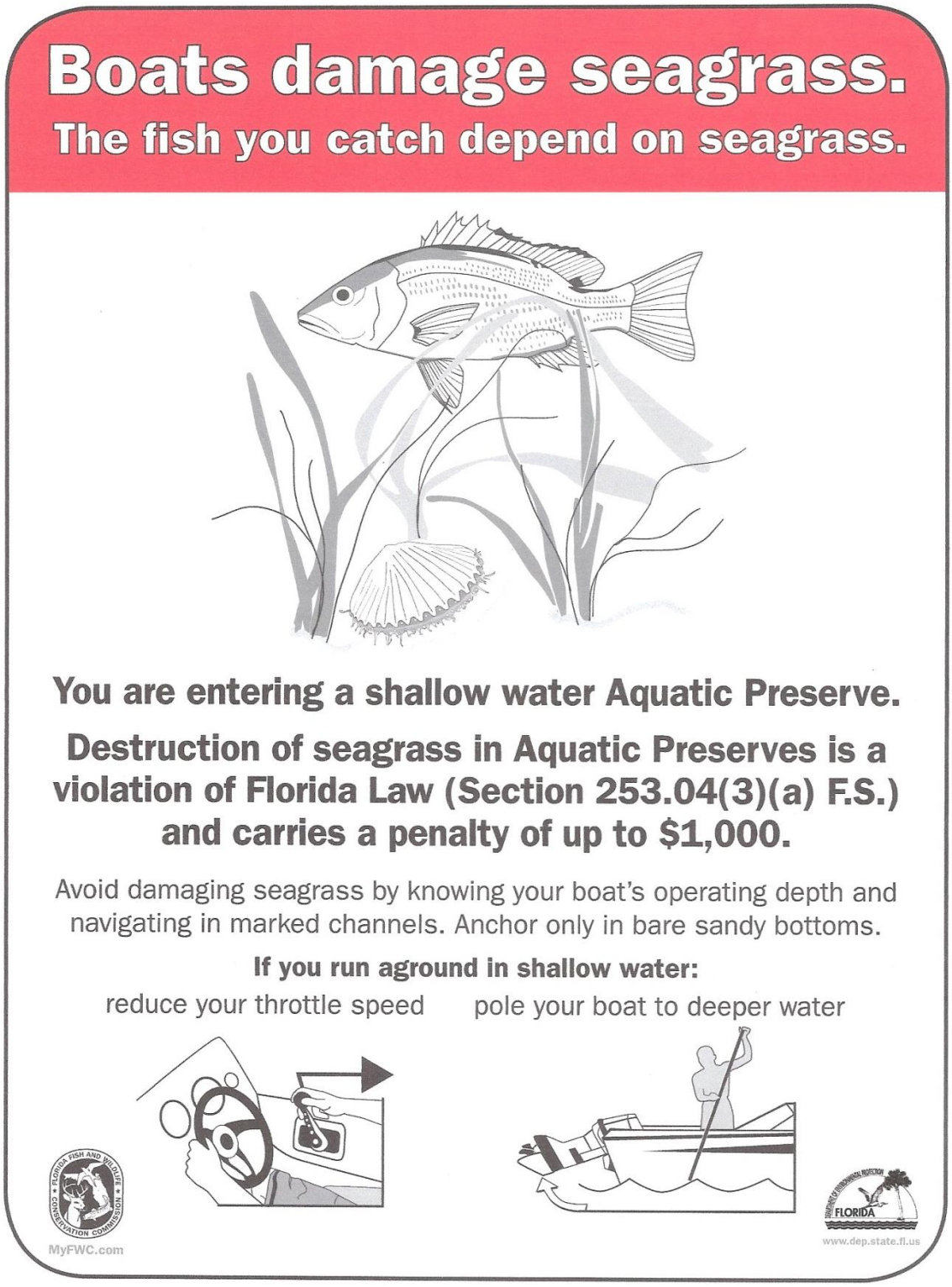

Figure 12-18. Florida Fish and Wildlife Conservation Commission signage 2009–2013.

BUOY NUMBER	LATITUDE	LONGITUDE
Presnell Channel	29° 44' 55.688"N	85° 18' 53.407"W
1	29° 44' 56.074"N	85° 18' 55.387"W
2	29° 44' 44.019"N	85° 19' 10.137"W
3	29° 43' 58.682"N	85° 19' 55.447"W
4	29° 43' 32.551"N	85° 19' 26.558"W
5	29° 43'37.040"N	85° 20'21.450"W
6	29° 43' 09.348"N	85° 19' 53.618"W
7	29° 42' 52.579"N	85° 20' 11.267"W
8	29° 42' 20.573"N	85° 19' 48.331"W
9	29° 42' 47.702"N	85° 20' 28.825"W
10	29° 42' 12.456"N	85° 20' 22.078"W
11	29° 42' 46.126"N	85° 21' 36.976"W
12	29° 42' 08.724"N	85° 21' 57.180"W
13	29° 41' 43.924"N	85° 21' 31.908"W
DOCK	29° 41' 13.430"N	85° 21' 40.089"W

Figure 12-19. Example Seagrass buoy brochure.

The restoration technique using sediment tubes has been scientifically reviewed and supported by the National Oceanic and Atmospheric Administration (NOAA), Florida Fish and Wildlife Conservation Commission (FWC), and the U.S. Fish and Wildlife Service (USFWS). Proper marking of the restoration areas would warn boaters of the shallow waters to promote recovery of the areas.

Finally, during in-water work periods, the *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006) and *Standard Manatee Conditions for In-Water Work* (USFWS 2011) will be implemented to minimize risks/impacts to aquatic species.

12.11.4 Operations and Maintenance

From the point of initiation, the project would be expected to take six months to a year to complete, with the exact start and stop dates being uncertain. This project would incorporate a mix of monitoring efforts to ensure project designs were correctly implemented during construction, and, in a subsequent period defined by contract, where corrective actions could be taken.

Postconstruction performance monitoring would initially focus on plant survival and revegetation of the existing scars. This monitoring may include collection of habitat information such as the depth of the scar at different points in time, and percent vegetative cover of the scar. Additional information collected may include utilization and integrity of the bird stakes over time, and nature and extent of any subsequent seagrass habitat scarring in areas where the new non-regulatory buoys are placed.

Pre- and post-project monitoring could compare restoration progress in both control and study areas. Changes in the number, length, and cover of propeller scars would be determined in large replicate photograph plots in each study area. Aerial photography could be performed annually, in late summer. Data layers would be created using ArcMap to determine the increase or decrease in scar number, length, and area over time.

Field surveys would be performed biannually in the early spring and late summer to monitor the progress of the restoration activities. The criteria for choosing both treated and untreated propeller scars for comparison would require that they do not have statistically significant differences in dimension (length and width), and that they are located in areas that contain similar seagrass densities. Methods designed to measure percent-cover and shoot counts would be used to compare recovery rates of propeller scars located within treated and untreated locations of the project area. Permanent (fixed) transects would be incorporated into the study to monitor changes in the number of untreated propeller scars. Underwater photographs and video would also be taken to document site characteristics prior to and following restoration efforts.

The Florida Department of Environmental Protection (FDEP) Aquatic Preserve staff would be responsible for monitoring and maintenance of the proposed project after the initial 3-year monitoring of the project. Pre- and post-project monitoring would compare restoration progress in both control and study areas. In addition, routine maintenance of signs and buoys would be conducted by FDEP throughout the monitoring period.

12.11.5 Affected Environment and Environmental Consequences

12.11.5.1 No Action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

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

12.11.5.2 Physical Environment

12.11.5.2.1 Geology and Substrates

Affected Resources

The existing geology and bottom sediments of St. Joseph Bay, St. Andrews Bay, and Alligator Harbor are predominantly sand, sand-silt-clay, sandy clay, and silty clay (Scott 2001). Based on surveys of the St. Andrews Bay Aquatic Preserve seagrass damage assessment conducted by the National Oceanic and Atmospheric Administration (NOAA) in 2012, average propeller scar depths (top of substrate to bottom of scar) range between 2.1 to 16.4 inches. Average area of damage (length × width) ranges between 43 and 5,382 square feet (reference FDEP Permit No. 17-0312090-001-EI). Data to support existing submerged substrate conditions of damaged seagrass habitat for St. Joseph Bay and Alligator Harbor Aquatic Preserves are not presently available. However, the extent of propeller scar damage and sediment characterization can be expected to be similar or greater than those of St. Andrews Bay Aquatic Preserve.

Environmental Consequences

The intent of the restoration project is to restore existing propeller scars by deploying sediment tubes and installing them in a manner that would mimic surrounding elevations and substrate contours in order to provide suitable habitat for seagrass recruitment. This project is expected to cause short-term impacts to existing submerged substrate and seagrass habitat surrounding the propeller scars, due to disturbance during placement of the sediment tubes and installation of the bird stakes. However, tidal circulation within the water column is expected to dilute suspended sediments generated from structure installation. In addition, the overall long-term benefit of reestablishing seagrass habitat in the damaged sites would be improved sediment stabilization once seagrass is established in the restoration areas. The proposed project would encourage proliferation of seagrass rhizomes (root structure) generation from adjacent habitat, thereby stabilizing sediment. Therefore, short-term impacts to existing substrates of the restoration sites and adjacent areas as a result of the proposed construction would be expected to be minor. Long-term adverse impacts to existing substrates are not expected as a result of the proposed project.

12.11.5.2.2 Hydrology and Water Quality

Affected Resources

Northwest Florida has seven major watersheds, all of which have been identified as priorities under the Surface Water Management and Improvement (SWIM) program. Water quality protection is the underlying goal of SWIM, along with the preservation and restoration of natural systems and associated public uses and benefits (Northwest Florida Water Management District [NWFWMD] 2011).

St. Joseph Bay is separated from the Gulf of Mexico by St. Joseph Peninsula and is considered the only body of water in the eastern Gulf that is not influenced by freshwater inflows (FDEP 2008). The bay has a surface area of 42,826 acres and connects to the Intracoastal Waterway by the Gulf County Canal (Thorpe 2000).

St. Joseph Bay is part of the St. Andrews Bay watershed system, which includes St. Andrews, West, East, and North Bays; St. Joseph Bay; and Deer Point Reservoir, as well as the respective surface water basins of each of these waterbodies. The waterways are primarily used for transportation, seafood harvesting, recreation, and waste disposal. Broad issues for the St. Andrews Bay system include degradation through point and nonpoint pollution sources, habitat quality that is threatened by and degraded through sedimentation and deposition, and public education and awareness (Thorpe 2000).

These aquatic preserves have good water quality conditions that promote seagrass growth. St. Andrews Bay is an estuary with relatively high salinity due to the low freshwater inflow provided by only a few spring-fed creeks. Alligator Harbor is a shallow estuary and a barrier sand spit lagoon. Because there is little fresh water flowing into the harbor, salinity levels are almost the same as the Gulf of Mexico.

Environmental Consequences

Project installation activities would use best management practices (BMPs) including impact avoidance of existing seagrass habitat through the use of small vessels. The timing of installation would depend on the timing of funding availability and the contract award along with any permit constraints required as a result of listed species considerations. Adverse impacts to hydrology and water quality would be minor, with moderate beneficial impacts expected as a result of restoring seagrass. The intent of the restoration project would be to restore existing propeller scars by deploying sediment tubes and installing them in a manner that would mimic surrounding elevations and substrate contours to provide suitable habitat for seagrass recruitment. Short-term turbidity levels above background could result from sediment tube placement. However, tidal current is expected to dilute suspended sediments. Once planting units are installed and seagrass colonization occurs in the restoration areas, ambient water-quality parameters would be expected to improve by providing enhanced water column filtration and nutrient uptake. Long-term adverse impacts to water quality would not be expected as a result of the proposed project. Short- and long-term adverse impacts to the hydrology of the proposed project areas as a result of sediment tube placement and installation of the bird stakes would be expected to be minor.

In-water work would require authorization from the USACE. The NOAA Restoration Center applied for and secured USACE Permit No. SAJ-2012-01546 (SP-SWA) on January 9, 2013, to construct the project in St. Andrews Bay, as well as other authorized waterbodies. However, USACE Permit No. SAJ-2012-01546 (SP-SWA) does not specifically include St. Joseph Bay and Alligator Harbor as authorized waterbodies for which construction is proposed. Therefore, a permit modification to Permit No. SAJ-2012-01546 or procurement

of a separate USACE permit may be necessary prior to construction to allow the proposed activity in St. Joseph Bay and Alligator Harbor. The existing USACE will expire December 20, 2017. No in-water work would be conducted until all permits, authorizations, or amendments were issued by USACE for the work.

12.11.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

The Clean Air Act (CAA) requires that the Environmental Protection Agency (EPA) set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. NAAQS have been set for six common air pollutants (also known as criteria pollutants), consisting of particle pollution or particulate matter, ozone, carbon monoxide, sulfur dioxide (SO_2), nitrogen dioxide, and lead. Particulate matter is defined as fine particulates with a diameter of 10 micrometers or less (PM_{10}), and fine particulates with a diameter of 2.5 or less ($PM_{2.5}$). When a designated air quality area or airshed in a state exceeds the NAAQS, that area may be designated as a "nonattainment" area. Areas with levels of pollutants below the health-based standard are designated as "attainment" areas. To determine whether an area meets the NAAQS, air monitoring networks have been established and are used to measure ambient air quality. The EPA also regulates 187 hazardous air pollutants (HAPs) that are known or suspected to cause cancer or other serious health impacts. Air quality in the Florida panhandle is in attainment with the NAAQs (EPA 2013).

Greenhouse Gasses

Gases that trap heat in the air are called greenhouse gases (GHGs). The primary GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_x), and fluorinated gases. Over the past century, human activities have released large amounts of GHGs into the atmosphere, which are contributing to global warming. Global warming is defined as the ongoing rise in global average temperature near the Earth's surface and is known to cause changes in climate patterns.

According to the EPA, the average annual temperature in the southeast portion of the United States has increased by approximately 2.0 degree Fahrenheit (°F) since 1970. Winters, in particular, are getting warmer, and the average number of freezing days has decreased by 4 to 7 days per year since the mid-1970s. Most areas are getting wetter; autumn precipitation has increased by 30% since 1901 (EPA 2013b). In many parts of the region, the number of heavy downpours has increased. Despite the increases in fall precipitation, the area affected by moderate and severe drought has increased since the mid-1970s (EPA 2013b).

Average annual temperatures in the region are projected to increase from 4°F to 9°F by 2080. Hurricane-related rainfall is projected to continue to increase. Models suggest that rainfall will arrive in heavier downpours, with increased dry periods between storms. These changes would increase the risk of both flooding and drought. The coasts will likely experience stronger hurricanes and sea level rise. Storm surge could present problems for coastal communities and ecosystems (EPA 2013b).

Total GHG emissions in Florida from 1990 to 2007 have increased at an average rate of 2.1% per year. Total GHG emissions in 2007 were 290 million metric tons of CO_2 equivalent ($MMTCO_2E$). In 2007, 91% of GHG emissions in Florida were CO_2 emissions (FDEP 2010).

Environmental Consequences

Project implementation would require little use of heavy mechanized equipment, which would lead to temporary air pollution (e.g., criteria pollutants, HAPs, GHGs) due to emissions from the operation of

construction vehicles and equipment. Therefore, any air quality impacts that occurred would be minor due to their localized nature and short-term duration as well as the small size of the project. Available BMPs would be employed to prevent, mitigate, and control potential air pollutants during project implementation. No air quality-related permits would be required.

A boat, truck, and hand tools would be the only construction equipment necessary for the proposed project. The boat and pickup truck would be the only equipment likely to emit GHG emissions; GHG emissions from the remaining equipment would be negligible. Using the operating assumption of 8 hours per day and 5 days per week for 6–7 months, GHG emissions from the boat and pickup truck have been estimated (Table 12-14).

Table 12-14. GHG emissions.

EQUIPMENT[1]	NUMBER OF 8-HOUR DAYS	CO_2 (METRIC TONS)[2]	CH_4 (CO_2E) (METRIC TONS)[3]	NO_X (CO_2E) (METRIC TONS)	TOTAL CO_2E (METRIC TONS)
Boat	210	1.365	0.042	0.546	1.953
Pickup Truck	180	1.98	0.63	7.92	10.53
TOTAL		**3.345**	**0.672**	**8.466**	**12.483**

[1] Emissions assumptions for all equipment are based on 8 hours of operation.
[2] CO_2 emissions assumptions for diesel and gasoline engines are based on EPA 2009.
[3] CH_4 and NO_x emissions assumptions and CO_2e calculations are based on EPA 2011.
[4] Emissions assumptions 0for an 8-cylinder, 6.2-liter gasoline engine Ford F150 pickup based on DOE 2013 and 18-gallon (half-tank) daily fuel consumption.

At the completion of the project, there may be an increase in recreational activity in the project area waters that would be enhanced as a result of improved fishing and bird-watching opportunities from improved seagrass habitat conditions. Increased exhaust emissions could affect air quality over the long term. However, adverse impacts to air quality are expected to be minor because management actions could be taken to limit boat use.

12.11.5.2.4 Noise

Affected Resources

Noise can be defined as unwanted sound and noise levels, and its effects are interpreted in relation to effects on nearby visitors to the recreational areas and wildlife in the project vicinity. The Noise Control Act of 1972 (42 USC 4901–4918) was enacted to establish noise control standards and to regulate noise emissions from commercial products such as transportation and construction equipment. The standard measurement unit of noise is the decibel (dB), which represents the acoustical energy present. Noise levels are measured in A-weighted decibels (dBA), a logarithmic scale that approaches the sensitivity of the human ear across the frequency spectrum. A 3-dB increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear. Table 12-15 shows typical noise levels for common sources expressed in dBA. Noise exposure depends on how much time an individual spends in different locations.

Table 12-15. Common noise levels.

NOISE SOURCE OR EFFECT	SOUND LEVEL (DBA)
Rock-and-roll band	110
Truck at 50 feet	80
Gas lawnmower at 100 feet	70
Normal conversation indoors	60
Moderate rainfall on foliage	50
Refrigerator	40
Bedroom at night	25

Source: Adapted from U.S. Department of Energy and Bonneville Power Administration (1986).

Noise levels in the project areas vary depending on the season, time of day, number and types of noise sources, and distance from noise sources. Existing sources of noise in the project areas are mainly from recreational boating, with occasional overhead aircraft or commercial traffic. Ambient natural sounds such as wind, waves, and wildlife also contribute to existing noise levels. Existing ambient noise levels in the three Aquatic Preserves are generally low and predominantly result from daily boating activities.

Noise-sensitive receptors include sensitive land uses as well as individuals and/or wildlife that could be affected by changes in noise sources or levels due to the proposed project. Noise-sensitive receptors in the project vicinities include beach and park recreational use and wildlife. The project areas are, for the most part, remotely located.

Environmental Consequences

Instances of increased noise would be expected during the material delivery and construction phases associated with the restoration project. The proposed project would generate construction noise associated with equipment used to fill the sediment tubes, loading the tubes onto watercraft used for transport to restoration sites, navigational transport of sediment tubes to each restoration site, and installation of bird stakes and buoy placement. In the short term, machinery and equipment used during construction to deliver material and construct the sediment tubes would generate noise, which may disturb wildlife and humans using the area. These noise levels would be kept to a minimum via BMPs such as turning boats off during idling, and working only during daylight hours. Noise generated from outboard motors and vessel maneuvering to transport and install the sediment tubes and bird stakes at the restoration sites would be no more than that generated by existing recreational watercraft in the project area. Noise from project installation would be comparable to ambient noise levels at the restoration sites. However, installation of bird stakes using hand-held devices would create noise and/or vibration that may expand the extent of impacts on wildlife. Adverse impacts from noise during the construction phase would be temporary, located in relatively remote areas, and minor relative to anticipated levels and exposure. Once built, the proposed project would not cause long-term noise impacts.

12.11.5.3 Biological Environment

12.11.5.3.1 Living Coastal and Marine Resources

Vegetation

Affected Resources

The three project areas are designated by the State of Florida as Aquatic Preserves for their known natural resources occurrences and regional ecological significance. Seagrass communities characterize the SAV of the three project areas. In addition, the adjacent shorelines in proposed project locations include a mix of saltmarsh and sandy beach habitat.

The seagrass communities of St. Joseph Bay, St. Andrews Bay, and Alligator Harbor are dominated by turtlegrass, which is the target restoration species for the project. Shoal grass (*Halodule wrightii*) and manatee grass (*Syringodium filiforme*) are interspersed in the seagrass communities, depending on the project area.

Seagrass communities are essential breeding, rearing, and feeding grounds for many important recreational and commercial fisheries as well as wildlife, including the endangered West Indian manatee (*Trichechus manatus latirostris*) as well as various species of sea turtles. Shallow seagrass habitat in the three Aquatic Preserves was damaged by watercraft propeller scars during the *Deepwater Horizon* oil spill response period. Based on previous surveys of the seagrass communities of the project area, approximately 2 acres of propeller scars were reported. The scar areas are located in generally shallow, estuarine/marine waters, approximately 2–6 feet deep, which is a factor in the original scarring and would contribute to the heavy reliance on shallow draft boats and manual placement of the sediment tubes, bird stakes, signage, and buoys for the proposed project.

Environmental Consequences

If not restored, the damaged seagrass habitat would continue to erode and destroy more of the healthy habitat surrounding the injured areas. During installation of the sediment tubes, short-term potential impacts would be expected and would include temporary damage to seagrass surrounding the propeller scars as a result of watercraft access to the restoration sites, placement of the sediment tubes, and trampling during restoration. Every effort would be made to access the restoration sites during periods of high tide using shallow draft vessels to minimize potential adverse impacts to seagrass habitat as a result of navigation. Therefore, impacts to seagrass would be short term and minor. The long-term benefits of the seagrass recovery effort would outweigh potential short-term adverse impacts, and include restoration of this community type, water quality enhancement, protection of the resource using buoy markers to discourage vessel entry, or encourage idle speed, and increased habitat for commercial and recreational fisheries.

The FDEP would require permits and impose reasonable conditions as are necessary to ensure that construction would comply with the provisions of Chapter 62-346.050 (3) of the Florida Administrative Code (FAC), which states in part that dredging and filling in, on, or over surface waters of the state remains subject to the requirements of FAC Chapter 62–312, including the need to obtain a separate permit under that chapter until the effective date of the rules adopted under Section 373.4145(1)(b), Florida Statutes (FS). The FDEP permit also grants state-owned Submerged Lands Authorization from the

Board of Trustees of the Internal Improvement Trust Fund, pursuant to Article X, Section 11 of the Florida Constitution, and Section 253.77, F.S., and Chapter 258, F.S.

On August 17, 2012, the NOAA Restoration Center secured FDEP Environmental Resource Permit No. 17-0312090-001-EI to construct the project in St. Andrews Bay as well as at other authorized waterbodies. However, FDEP Permit No. 17-0312090-001-EI authorizes the proposed activity in St. Andrews Bay and does not specifically include St. Joseph Bay and Alligator Harbor as authorized waterbodies for which construction is proposed and the permit was issued to NOAA. Therefore, a permit modification to FDEP Permit No. 17-0312090-001-EI or a procurement of separate FDEP permit may be necessary to allow the proposed activity in St. Joseph Bay and Alligator Harbor. The existing FDEP permit will expire August 17, 2017.

12.11.5.4 Wildlife Habitat

Affected Resources

The three Aquatic Preserves provide crucial nursery and forage habitat for many commercial and recreational fisheries and wildlife, including marine and estuarine invertebrates, wading birds (herons and egrets), and birds of prey that feed on juvenile and adult fish (FDEP 2008). The most common resident marsh and wading birds are great blue heron (*Ardea herodias*), little blue heron (*Egretta caerulea*), white ibis (*Eudocimus albus*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), tricolored egret (*Egretta tricolor)* yellow-crowned night heron (*Nyctanassa violacea*), and black-crowned night heron (*Nycticorax nycticorax*). Urban and open vacant land adjacent to the project area may serve as a refuge and staging area for many passerine birds during migration, and large concentrations of shorebirds are sometimes observed feeding in the mudflats. Protected wildlife (such as sea turtles, porpoises, and manatee, discussed in detail below) also forage on or within seagrass communities at the project sites.

St. Joseph Bay is a designated Important Bird Area of more than 8,500 acres made up of several parcels: Black's Island, Eglin Air Force Base Test Site, Palm Point, St. Joseph Bay Buffer, T.H. Stone Memorial, and St. Joseph Peninsula State Park and all provide important habitats for breeding and wintering migratory birds. No terrestrial wildlife (non-bird) surveys have been conducted in the project area; however, based on the types of habitat present, and because of its size, elevation, and location, it would be expected that ruderal species such as raccoon (*Procyon lotor*), opossum (*Didelphimorphia*), gray squirrel (*Sciurus carolinensis*), and other non-game mammals may be present in upland areas in the project area.

12.11.5.5 Marine and Estuarine Fauna (Fish, Shell Beds, and Benthic Organisms)

Affected Resources

A number of aquatic species are found in the project area. Fish species are abundant and include sea trout (*Salmo trutta*), redfish (*Sciaenops ocellatus*), searobins (*Triglidae*), flounders (*Paralichthys*), porgys (*Sparidae*), and a host of other estuarine and juvenile marine fish (FDEP 2008). Benthic organisms such as bivalves, gastropods and other mollusks, anemones, amphipods, annelids, crustaceans, and echinoderms are also abundant in these waters.

Environmental Consequences

The proposed project would likely result in short-term minor impacts due to placement of the sediment tubes into propeller scars where invertebrates or sessile organisms may have established themselves and be present. Small fish that may seek protection in the scars are highly mobile and would be

displaced to more suitable habitat in the project area. In addition, sessile invertebrates occupying the submerged substrate and fish may be disturbed or displaced in the short term from areas where bird stakes and identification buoys would be placed. However, these species are typically numerous in Gulf of Mexico waters and typically recolonize quickly.

The proposed project would result in long-term benefits to marine and estuarine fauna by providing additional fish habitat, increased benthic productivity, and enhanced recruitment and production of fish and crustaceans. Restoration of the seagrass habitat would benefit numerous aquatic species, including but not limited to blue crab (*Callinectes sapidus*), bay scallop (*Aquipecten irradians*), red drum (*Sciaenops ocellatus*), and speckled sea trout (*Cynoscion nebulosus*). Over the life of the project, the quality of the aquatic habitat would increase. The overall benefits to marine habitats that would result from seagrass restoration would outweigh potential short-term impacts to these species and their habitats.

12.11.5.6 Protected Species

Affected Resources

Protected species and their habitats include ESA-listed species and designated critical habitats, which are regulated by either the USFWS or the NMFS. Protected species also include marine mammals protected under the Marine Mammal Protection Act, essential fish habitat (EFH) protected under the Magnuson-Stevens Fishery Conservation and Management Act, migratory birds protected under the Migratory Bird Treaty Act (MBTA) and bald eagles protected under the Bald and Golden Eagle Protection Act (BGEPA). The federally listed threatened and endangered species reported for the three Aquatic Preserve project areas in Bay, Franklin, and Gulf Counties include five species of sea turtles, the West Indian manatee, the piping plover, the proposed red knot, and the Gulf sturgeon (USFWS 2013a).

The Trustees have reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS. For this, the Trusteesfirst reviewed the species list for Franklin and Bay counties, Florida[7]. Table 12-16presents a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

Table 12-16. Potential Impacts to Species/Critical Habitats managed by USFWS

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle[a], Hawksbill turtle[a], Kemp's ridley turtle; Leatherback turtle[a], Loggerhead turtle	No work will occur in the terrestrial environment; therefore no impacts will occur to sea turtle species in the terrestrial environment. Consultation has been completed with NMFS, the agency that has jurisdiction to review impacts to sea turtles in the estuarine and marine environments. The main risk to sea turtles during execution of this project would come from boat collisions which could result in harm or mortality. Critical habitat for the green sea turtle has been designated for the waters surrounding Culebra Island, Puerto Rico, and its outlying keys (63 FR 46693). Marine

[7] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

SPECIES/CRITICAL	SPECIES/CRITICAL HABITAT IMPACTS
	and terrestrial critical habitat for the leatherback sea turtle has been designated at Sandy Point on the western end of the island of St. Croix, U.S. Virgin Islands (44 FR 17710) and critical habitat will be reassessed during the future planned status review (76 FR 47133). Critical habitat for the hawksbill sea turtle has been designated for selected beaches and/or waters of Mona, Monito, Culebrita, and Culebra Islands, Puerto Rico (63 FR 46693). No designated critical habitat for the green, leatherback, or hawksbill sea turtles occurs within the action area. No critical habitat has been designated for the Kemp's ridley sea turtle; therefore, none will be adversely affected or modified. The project area does not overlap with the currently proposed critical habitat areas in Florida for Northwest Atlantic Distinct Population Segment of the loggerhead sea turtle as these habitats are terrestrial (i.e., beaches and shorelines) (78 FR 18000, Department of the Interior, 2013).
West Indian manatee	The counties in the project area are not part of the 36 Florida counties that are identified as being counties where manatees regularly occur in coastal and inland waters (U.S. Department of the Interior, 2011). However, manatees could be present in the project waters and would potentially seek out shallow seagrass areas as they are preferred feeding habitat (U.S. Department of the Interior, 2011). The main risk to manatees during execution of this project would come from boat collisions which could result in harm or mortality. The overall goal of the project is to improve the quantity and quality of the seagrass habitat that manatees prefer.
Piping plover	The main risk to Piping plovers is from human disturbance while nesting, roosting, foraging in habitats adjacent to marine work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the plovers to move to a nearby area. Because other foraging/nesting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The proposed project will not result in any changes to shoreline habitats where piping plover could be feeding or resting and is not expected to increase visitor use; therefore, no indirect impacts are expected. Piping plover critical habitat is not designated in or near the action area.
Red knot	The main risk to Red knots is from human disturbance while nesting, roosting, foraging in habitats adjacent to marine work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the plovers to move to a nearby area. Because other foraging/nesting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The proposed project will not result in any changes to shoreline habitats where piping plover could be feeding or resting and is not expected to increase visitor use; therefore, no indirect impacts are expected.
Gulf sturgeon	NMFS was consulted on Gulf sturgeon and its Critical Habitat in the estuarine environment. As a result, Gulf Sturgeon was not considered in the consultation with the USFWS.

Based on the Trustees'reviews of project materials (Spring 2014) in coordination with representatives from NOAA's Protected Resource Division (PRD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project falls outside of NMFS Endangered Species Act (ESA)

jurisdiction, as it does not contain a route of affect to species managed by NMFS. As a result, the project did not require further ESA evaluation from NOAA.

Additional information for some of the species listed above is provided below.

Sea Turtles and Marine Mammals

Five species of endangered or threatened sea turtles may occur or have potential to occur in the project areas. These are the green turtle, hawksbill turtle, Kemp's ridley turtle, leatherback turtle, and loggerhead turtle. Sea turtles forage in the waters of the coastal Florida panhandle region and are likely to occur in the project areas.

The endangered West Indian manatee has the potential to occur in project area waters and seek out shallow seagrass areas as preferred feeding habitat, and it is known to occur in the St. Andrews and St. Joseph Bay aquatic preserves (FDEP 2008, 2012)..

Gulf Sturgeon and Gulf Sturgeon Critical Habitat

Gulf sturgeon are restricted to the Gulf of Mexico and its drainages, occurring primarily from the Pearl River in Louisiana to the Suwannee River, in Florida (NMFS 2009). Adult fish reside in rivers for 8 to 9 months each year and in estuarine or Gulf of Mexico waters during the 3 to 4 cooler months of each year (NMFS 2009). Important marine habitats include seagrass beds with sand and mud substrates (Mason and Clugston 1993).

Gulf sturgeon critical habitat was jointly designated by the NMFS and USFWS on April 18, 2003 (50 Code of Federal Regulations [C.F.R.] 226.214). The proposed project area is located within the Florida Nearshore Gulf of Mexico Critical Habitat Unit 11, which contains winter feeding and migration habitat for Gulf sturgeon. Critical habitat was designated based on seven primary constituent elements essential for its conservation, as defined in the 2003 *Federal Register*.

These seven elements are listed below. Within the project area PCEs 1, 5, 6, and 7 are present in the project area.

1. Abundant food items such as detritus, aquatic insects, worms, and/or mollusks, within riverine habitats for larval and juvenile life stages; and abundant prey items such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages.
2. Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay.
3. Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, and generally but not always located in holes below normal riverbed depths, believed necessary for minimizing energy expenditures during fresh water residency and possibly for osmoregulatory functions.
4. A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging.

5. Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages.
6. Sediment quality, including texture and chemical characteristics necessary for normal behavior, growth, and viability of all life stages.
7. Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., an unobstructed river or a dammed river that still allows for passage).

Figure 12-20 shows Gulf sturgeon critical habitat areas in relation to the potential project locations.

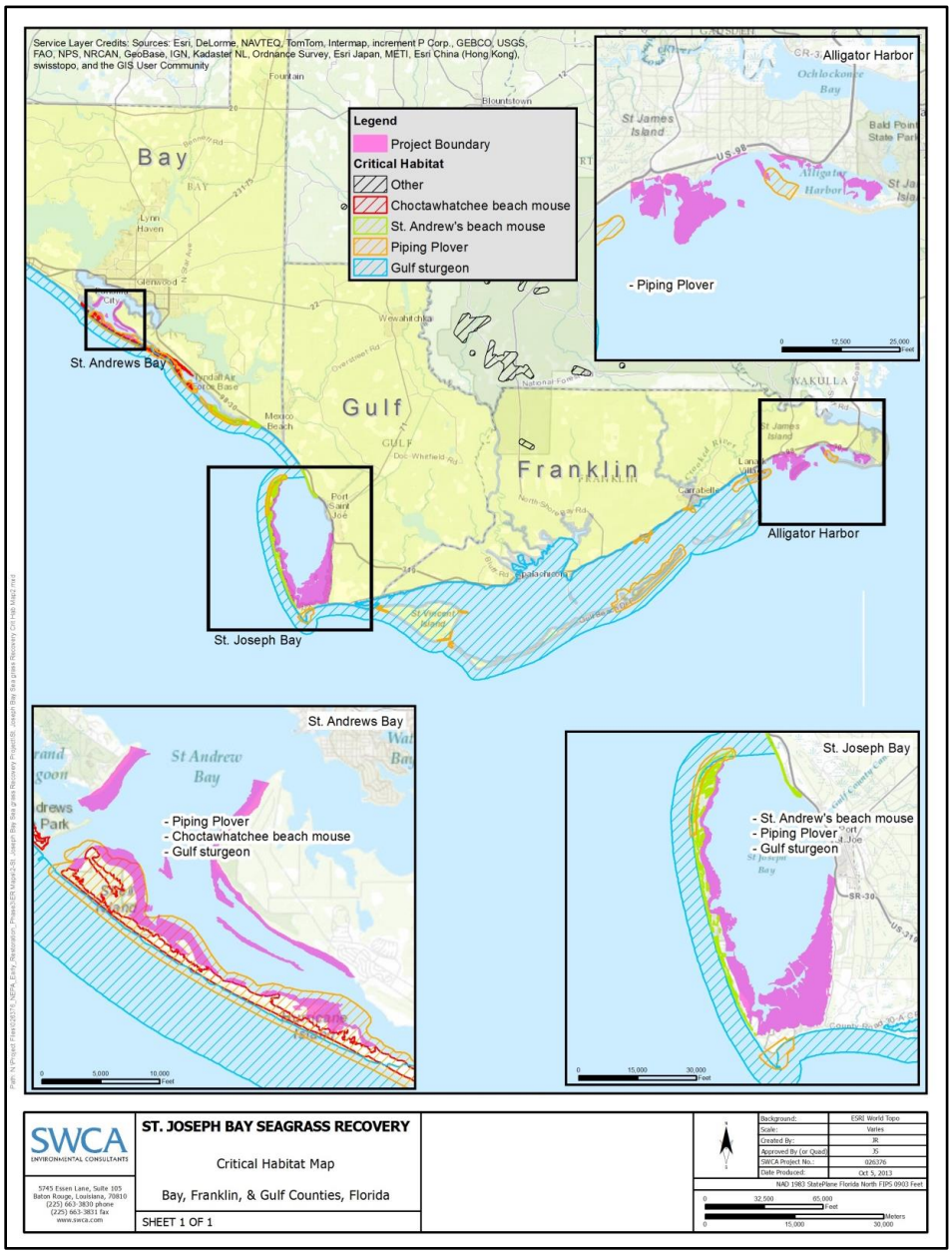

Figure 12-20. Critical habitat.

Essential Fish Habitat (EFH)

EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. The EFH within the project area include emergent wetlands, mud substrate, and estuarine water columns for species of fish, such as red drum, brown shrimp, pink shrimp, and white shrimp. There are no marine components of EFH in the vicinity of the project site.

Based on the Trustees review of project materials (Spring 2014) in coordination with representatives from NOAA's Habitat Conservation Division (HCD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project will not affect EFH because there is no route of affect to EFH in the project area. As a result, the project did not require further EFH evaluation.

Piping Plover

The sandy beaches and shorelines adjacent to the project areas offer suitable foraging and resting habitat for the piping plover during the winter migratory season, and piping plover may forage in the shallow waters of the project area. Natural shorelines in the proposed project vicinity provide suitable winter migration resting habitat for the piping plover. Piping plover wintering habitat includes beaches, mudflats, and sandflats, as well as barrier island beaches and spoil islands (Haig 1992, as cited by USFWS, accessed September 30, 2013). On the Gulf Coast, preferred foraging areas were associated with wider beaches, mudflats, and small inlets (USFWS 2013a). Although no piping plover critical habitat is located in the project areas, critical habitat is located less 2 two miles away from them.

Red Knot

The red knot, a federal proposed species, uses the state of Florida both for wintering habitat and migration stopover habitat for those that continue to migrate down to specific wintering locations in South America (Niles et al. 2008). Wintering and migrating red knots forage along sandy beaches, tidal mudflats, saltmarshes, and peat banks (Harrington 2001). Observations indicate that red knots also forage on oyster reef and exposed bay bottoms, and roost on high sand flats, reefs, and other sites protected from high tides (Niles et al. 2008). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Threats to wintering and stopover habitat in Florida include shoreline development, hardening, dredging, deposition, and beach raking (Niles et al. 2008).

State-Listed Birds, MBTA and BGEPA

There are numerous birds protected by the MBTA and the State of Florida with potential to occur in and around the seagrass restoration sites. These include the Arctic peregrine falcon (*Falco peregrinus tundrius*), southeastern American kestrel (*Falco sparverius paulus*), Southeastern/Cuban snowy plover (*Charadrius alexandrinus tenuirostris*), piping plover (discussed above), and red knot (discussed above. Both the St. Andrews and the St. Joseph Aquatic Preserves species lists indicate numerous state-listed birds as well as bird species of special concern that are known to occur in the project area.

Bald eagles are known to nest in the vicinity of all three preserves. There are seven known bald eagle nests within 1 mile of project activities in the St. Joseph Aquatic Preserve; there are three within 5 miles

of project activities at the Alligator Harbor Aquatic Preserve; and there are 8 bald eagle nests within 1 mile of St. Andrews Aquatic Preserve restoration activities (FWC 2012). The bald eagle feeds on fish and other readily available mammalian and avian species, and is dependent on large, open expanses of water for foraging habitat.

The proposed project was also reviewed for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), respectively. Table 12-17 provides a summary of the different migratory bird groups specifically addressed by this review and summarizes the potential impacts to these groups and associated habitats that could result from the implementation of this project.

Table 12-17. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, roosting, nesting	Seabirds forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily roost in the dunes. Therefore the Trusteesdo not anticipate impacts.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized inTable 12-18.

Table 12-18. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care will be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbances will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project will occur during daylight hours only. Nesting will not be impacted because the project will not occur during nesting season and activity is limited to open water areas.

Environmental Consequences

The proposed project restoration activities would restore seagrass habitat that many protected species rely on for forage, refuge, and nursery areas essential for the marine and estuarine ecosystems of the three Aquatic Preserves and nearby Gulf of Mexico waters. The proposed project has been evaluated for potential short- and long-term impacts to state-listed and federally listed threatened and endangered species that may occur in and adjacent to the project areas, based on available suitable habitat and restoration goals. Descriptions of the evaluation for these species are provided below.

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. October 21, 2013 thee review of potential impacts to species managed by USFWS was completed (Fay, 2014). The USFWS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect West Indian manatee, piping plover, and red knot (if listed). The USFWS also concurred with the Trustees'determination that the project will have no effect on five species of sea turtles in terrestrial habitats (green, hawksbill, Kemp's ridley, leatherback, and loggerhead).

The Trustees also evaluated the potential for take of Marine Mammals under the MMPA and due to these species' mobility and the implementation of NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006), *Standard Manatee Conditions for In-Water Work* (USFWS 2011), and USFWS recommended conservation measures for listed species and other trust resources, take of marine mammals under the MMPA is not anticipated.

State-Listed Birds, MBTA and BGEPA

Migratory birds may nest, forage, and/or rest on beaches or mudflats in the vicinity of seagrass restoration activities. If seagrass restoration occurs during the nesting season (February 15 to August 13), these birds could be disturbed by noise generated from in-water construction activities. This would be a short-term minor impact. To avoid this impact, construction within 300 feet of suitable nesting habitat would be avoided during the nesting season. If construction could not avoid the nesting season, a preconstruction survey would be conducted by a qualified biologist, and if nesting birds were identified within 300 feet of project activities, the FWC and USFWS would be contacted regarding the placement of appropriate buffers to ensure no impacts to nesting birds would occur. Contractors would be required to be aware of and comply with applicable laws prohibiting harm to migratory birds and endangered species.

The project is proposed to occur in open water near the shoreline and at popular boat ramps (for outreach signage). Open-water seagrass restoration activities would include in-water work that would disturb seabirds or other wildlife due to turbidity, acoustical vibration, and noise impacts during sediment tube transport by small draft vessels, outboard engine operation, and hammering impacts during installation of the bird stakes or signs. Avoidance and minimization measures to prevent impacts to these migratory birds include minimizing noise and vibration near areas where foraging or resting birds were encountered (USFWS 2013a). All disturbances would be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity, when given the opportunity. Additionally, foraging habitat is abundant in all three of the restoration sites, and the seagrass restoration activities would take place in only a small portion of these areas. Therefore, foraging birds or other wildlife would not be impacted as a result of seagrass restoration activities. Roosting should not be impacted because the project would occur during daylight hours only. Nesting would not be impacted because the project would not occur during nesting season and activity would be limited to open water areas.

Bald eagles are known to nest near the St. Joseph Bay, St. Andrews Bay, and Alligator Harbor project areas. If bald eagle breeding or nesting behaviors are observed, or an active nest is determined to be within the project vicinity, conservation measures from USFWS and FWC will be implemented avoid impacts to breeding and nesting bald eagles (see Chapter 6 for specific measures).

Consultation with the FWC concerning the proposed project and anticipated construction schedule relative to known bald eagle nest sites in the project area and the nesting season in Florida (October 1 to May 15) would be required prior to commencement of restoration activities. To minimize potential for impacts to nesting bald eagle, consultation protection measures may include 1) addressing prescribed nest tree protection zones, and 2) preparation of a bald eagle nest protection plan (including nesting behavior disturbance monitoring). Bald eagles have been known to be tolerable to certain potential disturbances within their breeding territories. Should these conservation measures be implemented for active nest sites adjacent to restoration activities in the St. Joseph Bay and Alligator Harbor project areas, potential impacts to the bald eagle would be short term and minor.

Bald eagles are not present at the proposed project locations within a distance that would require conservation measures so they will not be affected. At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

Invasive Species

Affected Resources

Non-native invasive species could alter the existing terrestrial or aquatic ecosystem within the project area, and possibly expand out into adjacent areas after the initial introduction. The invasive species threat, once realized, could result in economic damages. Prevention is ecologically responsible and economically sound. Chapter 7 addresses invasive species, pathways, impacts, and prevention. At this time specific invasive species that may be present on the project site or could be introduced through the project have not yet been identified.

Environmental Consequences

Best Management Practices (BMPs) to control the spread of any invasive species present, and prevent the introduction of new invasive species due to the project will be implemented. In general, best management practices would primarily address risk associated with vectors (e.g., construction equipment, personal protective equipment, delivery services, foot traffic, vehicles/ vessels, shipping material). There are many resources that provide procedures for disinfection, pest-free storage, monitoring methods, evaluation techniques, and general guidelines for integrated pest management that can be prescribed based upon specific site conditions and vectors anticipated. In addition, to best management practices, outreach and educational materials may be provided to project workers and potential users/visitors. Other measures that could be implemented are identified in the Chapter 6 Appendix. Due to the implementation of BMPs, the Trusteesexpect impacts due to invasive species introduction and spread to be short term and minor.

12.11.5.7 Human Uses and Socioeconomics

12.11.5.7.1 Socioeconomics and Environmental Justice

Affected Resources

According to the 2010 census, the combined population of Bay, Gulf, and Franklin Counties was 196,264 (U.S. Census Bureau 2013) (Table 12-19). Bay County was the most populous of the three counties with 168,852 people, resulting in an average density of 222.6 individuals per square mile. Gulf and Franklin Counties together had a population of 27,412, resulting in an average density of 25 individuals per

square mile. Whites represented the largest group, comprising approximately 80% of the population of all three counties. The second largest group was African American, representing 11% to 19%. Five percent of the population was Hispanic or Latino (U.S. Census Bureau 2013). According to the economic development organization, Enterprise Florida (2013), more individuals worked in industries such as leisure and hospitality; trade, transportation, and utilities; public administration; and education and health services than other industries. Tyndall Air Force Base is located in Bay County.

Table 12-19. Population of Florida, Bay, Gulf, and Franklin Counties.

POPULATION	FLORIDA COUNTY		BAY COUNTY		GULF COUNTY		FRANKLIN COUNTY	
Population, 2010	18,801,310		168,852		15,863		11,549	
White alone	14,721,426	78.3%	139,978	82.9%	12,405	78.2%	9,597	83.1%
Black or African American	3,121,017	16.6%	18,743	11.1%	3,030	19.1%	1,628	14.1%
American Indian and Alaska Native alone	94,007	0.5%	1,182	0.7%	79	0.5%	81	0.7%
Asian alone	507,635	2.7%	3,715	2.2%	63	0.4%	46	0.4%
Native Hawaiian and other Pacific Islander alone	18,801	0.1%	169	0.1%	0	0%	12	0.1%
Two or more races	357,225	1.9%	4,897	2.9%	286	1.8%	185	1.6%
Hispanic or Latino	4,361,904	23.2%	8,780	5.2%	730	4.6%	577	5.0%
White alone, not Hispanic or Latino	10,716,747	57.0%	132,718	78.6%	11,723	73.9%	9,078	78.6%

Environmental Consequences

There are no indications that the proposed seagrass enhancement project would be contrary to the goals of Executive Order 12898, or would create disproportionate, adverse human health or environmental impacts on minority or low-income populations of the surrounding community. Therefore, no adverse impacts to the socioeconomics of the regional population in Bay, Gulf, or Franklin Counties would be anticipated as a result of the proposed project.

The proposed restoration of seagrass habitat in the project areas would potentially provide indirect minor beneficial impacts to the local economy due to increased recreational activity in response to fishing and bird-watching opportunities provided by the restoration effort. Restoration of seagrass habitat would benefit numerous aquatic species popular with recreational fisherman, such as blue crab, bay scallop, red drum, and speckled trout.

12.11.5.7.2 Cultural Resources

Affected Resources

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area .

Environmental Consequences

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

12.11.5.7.3 Land and Marine Management

Affected Resources

Seagrass beds constitute sovereign submerged lands owned and governed by the State of Florida; therefore, any projects undertaken on those lands must receive authorization from the Board of Trustees of the Internal Improvement Trust Fund, pursuant to Article X, Section 11 of the Florida Constitution, Section 253.77, F.S., and Chapter 258, F.S. An Environmental Resource Permit must be attained from FDEP.

Additionally, the *St. Joseph Aquatic Preserve Management Plan* indicates the importance of seagrass to the overall health and well being of the preserve ecosystems (FDEP 2008). The FDEP also indicates the important of seagrass to the Alligator Harbor Aquatic Preserve (FDEP 2012).

Environmental Consequences

Under the proposed project, no changes would occur to the current land use at the St. Joseph Bay, St. Andrews Bay, and Alligator Harbor Aquatic Preserves. Land use and management authority of the three Aquatic Preserves would remain under the purview of FDEP, and no development at the project sites would occur. The proposed project would be consistent with existing management and plans at the preserves. Ultimately, the proposed project would continue to provide and enhance essential fisheries habitat and sanctuary for wildlife, including threatened and endangered species dependent on seagrass communities for much of their life cycle. The proposed restoration would be conducted and maintained in accordance with state and federal permits previously secured for the project area in Bay County (St. Andrews Bay), or those permits (or amended permits) that may be required for the proposed project in Gulf and Franklin Counties (St. Joseph Bay and Alligator Harbor, respectively). The FDEP Environmental Resource Permit process is being initiated through the *Deepwater Horizon* Phase III federal liaison process. Therefore, potential adverse impacts to land and marine management resources would not be expected.

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS (Federal Trustees 2013). The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process (Milligan 2014).

12.11.5.7.4 Aesthetics and Visual Resources

Affected Resources

The land uses around all three of the proposed project sites are either for state park land, sparsely populated residential areas, or Tyndall Air Force Base. The general visual character of three Aquatic Preserves can be described as undeveloped or open space consisting of native estuarine habitat separated from the Gulf of Mexico by barrier islands. Unobstructed views of open water characterizing the project area exist from these barrier islands at higher elevations on the land.

Environmental Consequences

Temporary impacts to visual resources would result from implementation of the proposed restoration activities. Construction equipment would be temporarily visible to visitors and recreational users at the project access points (i.e., boat ramps and launch areas). These construction-related impacts to visual resources would be minor, since the vessel launch areas are not readily visible from urbanized areas or park systems, and equipment would only be visible to visitors arriving at the boat ramp areas to launch or those boaters arriving dockside from the project waterways to load. Because the seagrass restoration would consist of the manual placement of sediment tubes, protection buoys, and bird stakes from boats in the large expanse of open-water estuarine areas, no impacts to visual resources would be anticipated. Seagrass restoration would be anticipated to result in a long-term, minor visual enhancement to the three Aquatic Preserves, as the project is intended to mimic the natural process associated with estuarine systems. Therefore, the proposed project impacts would be minor and would not be expected to adversely affect current aesthetics or visual resources.

12.11.5.7.5 Tourism and Recreational Use

Affected Resources

According to the economic development organization, Enterprise Florida's County Profiles for Gulf, Bay, and Franklin Counties (2013), the primary recreational opportunities in these counties are boating, fishing, swimming, diving, snorkeling, and golfing. St. Andrews State Park, St. Joseph Peninsula State Park, and St. George Island State Park are located in this area.

Environmental Consequences

The duration of the proposed project would be relatively short; therefore, negative impacts to recreational experience would be minor as a result of noise and visual disturbances during placement of the sediment bags, protection buoys, and bird stakes. Public access to waters from boat ramps would potentially be restricted during project launching activities. Although temporary inconveniences would result in minor negative impacts to tourism and recreational use, over the long term the project would not result in adverse impacts to tourism and recreational use. Opportunities for recreational activity in the project waters would be enhanced as a result of improved fishing and bird-watching opportunities from improved seagrass habitat conditions. Enhancement of the seagrass beds would provide additional habitat that would be beneficial to recreational activities such as fishing, snorkeling, and diving. Over the long term, the project would result in minor beneficial impacts to tourism and recreational uses.

12.11.5.7.6 Infrastructure

Affected Resources

The Port of St. Joe, which is located on St. Joseph Bay, is one of three state-designated deep-water ports on north Florida's Gulf Coast. Access to the Gulf of Mexico is accomplished by an approximate 7-mile channel from the port to the north end of the bay. The port has two bulkheads and can accommodate ships with a 27-foot draft. Ships can directly access the Intracoastal Waterway from the port. St. Joseph Peninsula State Park maintains a marina and boat ramp on the west side of St. Joseph Bay. Alligator Point is sparsely populated but has a marina for recreational boaters and fishing charters. The project area in St. Andrews Bay is bordered by St. Andrews State Park, Shell Island, and Tyndall Air Force Base.

St. Joseph Bay, St. Andrews Bay, and Alligator Harbor Aquatic Preserves are relatively remote natural estuarine systems with no services or infrastructure. With the exception of St. Andrews Bay, the project waters are not located within the immediate vicinity of urban service centers. Panama City, an urbanized service center, is located immediately adjacent to St. Andrews Bay Aquatic Preserve. Hathaway Bridge (U.S. Route 98) connects Panama City to Panama City Beach to the west, and Du Pont Bridge (U.S. Route 98) connects to Tyndall Air Force Base to the east.

Environmental Consequences

The Port of St. Joe is located north of the project area. Because the port is outside the proposed project area, traffic from the port would not affect the seagrass enhancement project, nor would construction activities pertaining to the project have any adverse impacts to the port. Any impacts to the infrastructure around St. Andrews Bay and Alligator Point due to staging areas or increased boat ramp use would be short term and minor. Additionally, the proposed project is not expected to impact transportation, utilities, or any or other infrastructure.

12.11.5.7.7 Public Health and Safety and Shoreline Protection

Affected Resources

There are no known hazardous waste disposal facilities or active water discharge sites permitted in the project vicinity.

Environmental Consequences

The project would have no impact on public health and safety in the area. Enhancement of the seagrass beds would improve the water quality and habitat in the three Aquatic Preserves.

12.11.6 Summary and Next Steps

The proposed Florida Seagrass Recovery project would include surveying and mapping scarring within the seagrass habitats in the three Aquatic Preserves (St. Joseph Bay Aquatic Preserve, Alligator Harbor Aquatic Preserve, and St. Andrews Aquatic Preserve). Additionally, sediment tubes will then be manufactured, filled with local fine grain sediment, and deployed in approximately 2 acres of seagrass propeller scars. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would provide long-term benefits by restoring approximately 2 acres of seagrass habitat. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

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12.12 Perdido Key State Park Beach Boardwalk Improvements: Project Description

12.12.1 Project Summary

The proposed Perdido Key project would improve a number of existing boardwalks in Perdido Key State Park in Escambia County. The proposed improvements include removing and replacing six existing boardwalks leading to the beach from two public access areas. The total estimated cost for this project is $588,500.

12.12.2 Background and Project Description

The Trustees propose to improve and enhance a number of boardwalks in Perdido Key State Park in Escambia County (see Figure 12-21 for general project locations and Figure 12-22 for a detailed image of the western component of the project). The existing boardwalks need to be replaced after being reconstructed too close to the ground subsequent to Hurricane Ivan in 2004. As a result, the boardwalks are now being constantly covered by sand from the dune system, which is causing access issues.

The objective of the proposed Perdido Key State Park Boardwalk Improvement project is to enhance and/or increase recreational beach use opportunities by improving beach access. The restoration work proposed includes removing and replacing six existing boardwalks that lead to the beach.

12.12.3 Evaluation Criteria

This proposed project meets the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and related response actions, the public's access to and enjoyment of the natural resources along Florida's Panhandle was denied or severely restricted. The proposed Perdido Key State Park Beach Boardwalk Improvements project is intended to enhance and/or increase recreational beach use opportunities by improving beach access. The project would enhance and/or increase opportunities for the public's use and enjoyment of the natural resources, helping to offset adverse impacts to such uses that resulted from the Spill. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

The project is technically feasible and utilizes proven techniques with established methods and documented results and can be implemented with minimal delay. Agencies have successfully completed projects of similar scope throughout Florida over many years. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Additionally, the cost estimates are based on similar past projects therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.12, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.12 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4).This proposed project is not anticipated to negatively affect regional ecological restoration and is therefore not inconsistent with the long-term restoration needs of the State of Florida. See Section 6d of the Framework Agreement.

Figure 12-21. Location of the Perdido Key State Park Boardwalk Project.

Figure 12-22. Detailed image of the Western component of the Perdido Key State Park Boardwalk Project.

Many recreational use projects, including ones similar to this project, have been submitted as restoration projects on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Perdido Key State Park Boardwalk Improvements project also meets the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by response and SCAT activities for the Spill.

12.12.4 Performance Criteria, Monitoring and Maintenance

As part of the project cost, monitoring will be conducted to ensure project plans and designs were correctly implemented. Monitoring has been designed around the project goals and objectives. The project objective is to enhance and/or increase recreational beach use opportunities by improving beach access. Performance monitoring will evaluate the removal and replacement of the six existing boardwalks. Specific success criteria include: 1) the completion of the construction as designed and permitted, and 2) enhanced and/or increased access is provided to the natural resources, which will be determined by observation that the boardwalks are available and open.

Long-term monitoring and maintenance of the improved facilities will be completed by staff from the Florida Park Service as part of their regular public facilities maintenance activities. Funding for this post-construction maintenance is not included in the previously provided value for the project cost and will be accomplished by the Florida Park Service.

During the one year construction performance monitoring period, the Florida Trustees' Project Manager will go out twice to the site to record the number of users. Following the post construction performance monitoring period, the Florida Park Service will monitor the recreational use activity at the site. Florida Park Service staff will monitor the number of visitorsat the boardwalks on a routine basis. The visitation numbers will be kept by the Florida Park Service which is part of the Florida Department of Environmental Protection.

12.12.5 Offsets

The Trustees and BP negotiated a BCR of 2.0 for the proposed recreational use project. NRD Offsets are $1,177,000 expressed in present value 2013 dollars to be applied against the monetized value of lost recreational use provided by natural resources injured in Florida, which will be determined by the Trustees' assessment of lost recreational use for the Oil Spill. Please see Chapter 7 of this document (Section 7.2.2) for a description of the methodology used to develop monetized Offsets.[8]

12.12.6 Cost

The total estimated cost to implement this project is $588,500. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for engineering and design, construction, monitoring, and contingencies.

[8] For the purposes of applying the NRD Offsets to the calculation of injury after the Trustees' assessment of lost recreational use for the Spill, the Trustees and BP agree as follows:

- The Trustees agree to restate the NRD Offsets in the present value year used in the Trustees' assessment of lost recreational use for the Spill.
- The discount rate and method used to restate the present value of the NRD Offsets will be the same as that used to express the present value of the damages.

12.13 Perdido Key State Park Beach Boardwalk Improvements: Environmental Review

The Florida Park Service (FPS) and the Florida Department of Environmental Protection (FDEP) propose to improve beach access through the installation of improvements to the Perdido Key State Park boardwalks. The proposed Perdido Key project would enhance the existing boardwalks along Perdido Key in Escambia County. The proposed improvements include removing and replacing six existing boardwalks leading to the beach from two public access areas. The total estimated cost for this project is $588,500.

12.13.1 Introduction and Background

In April 2011, the Natural Resource Trustees (Trustees) and BP Exploration and Production, Inc. (BP) entered into the Framework Agreement for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is under way. The Framework Agreement is intended to expedite the start of restoration in the Gulf of Mexico in advance of the completion of the injury assessment process. Early restoration is not intended to, and does not fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects would be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement, after public review of a draft, the Trustees released a Phase I Early Restoration Plan (ERP) in April 2012. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, NOAA issued a public notice in the Federal Register on behalf of the Trustees, announcing the development of additional future Early Restoration projects for a Draft Phase III Early Restoration Plan (ERP).

The Trustees propose to improve and enhance a number of boardwalks along Perdido Key in Escambia County (see Figure 12-23 for general project locations and Figure 12-24 for a detailed image of the western component of the project). The existing boardwalks need to be replaced after being reconstructed too close to the ground subsequent to Hurricane Ivan in 2004. As a result, the boardwalks are constantly covered by sand from the dune system causing access issues.

The objective of the proposed Perdido Key boardwalk improvement project is to enhance and/or increase recreational beach use opportunities by improving beach access. The restoration work proposed includes removing and replacing six existing boardwalks that lead to the beach. Replacing the boardwalks would improve public access to the beach areas for visitors, especially ADA visitors. The total estimated cost for this project is $588,500. This cost reflects cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for engineering and design, construction, monitoring, and contingencies.

12.13.2 Project Location

The proposed project is located in Escambia County, Florida. The project area is Perdido Key State Park southwest of Pensacola, Florida, and work would be completed on the dunes and beaches facing the Gulf of Mexico (Figure 12-23). Access to the area would primarily be through the parking lot associated with the boardwalks (Figure 12-24).

Figure 12-23. Project Location Map, Perdido Key State Park Boardwalks.

12.13.3 Construction and Installation

The existing boardwalks would be removed and replaced. The new structures would be higher above the ground surface but the footprint of the new boardwalk would, to the extent possible, fall within the area defined by the existing boardwalks. Some lengthening of the boardwalk may be required to provide the additional height required to avoid sand coverage issues while still maintaining a design that complies with the requirements of the Americans with Disabilities Act (ADA). The extent of any lengthening would be addressed in the final engineering design and plan development. However, efforts would be made to minimize the lengthening to avoid encroachment into areas on the Gulf side of the dunes where sea turtles might nest. Currently, the boardwalks do not extend beyond the old seaward edge of the dunes, so the possibility of lengthening without extending beyond the seaward edge of the dunes exists in order to comply with ADA requirements and to avoid the new seaward edge of the dunes (dunes have migrated seaward in some areas (see Figures C and D). Some pilings may need to be replaced or

upgraded, and new pilings may be required in some locations. A combination of heavy equipment and hand tools would be used to complete project work, depending on specific design elements and needs.

Figure 12-24. Parking lots adjacent to project site.

The project areas would be isolated by construction fencing to prevent incidental access. This fencing material would be erected by hand driving (e.g., with a sledge hammer or post driver) stakes as necessary. These stakes would likely be less than 2 inches in diameter and driven to a depth of 1 foot to 2 feet to secure the fencing. Construction materials would be staged in the parking lot that accesses each of the existing boardwalk complexes (see Figures C and D). Additional materials could be temporarily placed *near but not within* the dune as needed to support the construction of the boardwalk (e.g., ladders, scaffolding, daily construction materials). Access will occur through existing points only (i.e., no new access points will be created).

Full details on construction methods including total size of the boardwalk, depth of placement and method of placement of pilings would be determined as part of the development of final plans and drawings with the award of the contract and different options could be pursued. The project would not be expected to result in a surplus of excavated materials. Excavated sand would be reincorporated at the site. No lighting is associated with the proposed project.

Construction would begin 7 to 12 months after funding is received and take 4-6 months to complete. Construction would likely occur between October and March, the low visitation season which would also avoid the turtle nesting season.

12.13.4 Operations and Maintenance

State park staff would perform operation and maintenance of the facility, which includes keeping the area clean of debris, routine inspection and repair of the boardwalks (e.g., maintaining or fixing loose boards), and similar tasks. Monitoring would include construction monitoring and enhanced use numbers.

The construction would be intensely monitored to ensure that the boardwalks are built according to plans, specifications, and permits. Once the construction is complete, the boardwalks would be under a 1-year warrantee period. Periodically the facilities would be reviewed for structural integrity and any failures would be required to be repaired by the contractor during the year under warrantee. A final complete warrantee inspection would be performed by the contract manager and state parks personnel. State Park staff would provide maintenance after the warrantee period at the end of the year, and any defects that might be noted and repairs that might be required would be made by the contractor. Once the boardwalks are built, State Park staff would record usage of the boardwalks, through parking lot counts during the off season, and revenue acquired during the high visitation season.

12.13.5 Affected Environment and Environmental Consequences

12.13.5.1 No Action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

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

12.13.5.2 Physical Environment

12.13.5.2.1 Geology and Substrates

Affected Resources

The project area lies within the geographical division known as the West Florida Coast Strip that extends from the mouth of the Ochlockonee River west to Mississippi. Sediments at the proposed project location are primarily sandy. Soil types at the proposed project location are beaches. There are no known minerals of commercial value on Perdido Key State Park (FDEP 2006). The potential for contaminants at the construction site is considered to be extremely low, since the area has already been worked on to install the initial boardwalks.

Environmental Consequences

No adverse impacts to local geology, soils, and sediments associated are anticipated within the project area. This type of construction does not typically require erosion control measures. If erosion control measures are determined necessary, it would be required as a part of the permitting process and would be managed by the construction contractor throughout construction activities and would be monitored

on a daily basis by the contracting authority (FDEP). As a result of the proposed project, impacts to geology and substrates would likely be short-term and negligible.

12.13.5.2.2 Hydrology and Water Quality

Affected Resources

Perdido Key State Park is located in the northwestern portion of the state, where hydrology is very complex. Deposits are predominantly marine in origin and generally dip toward the south. Although the strata range from Paleozoic to Recent, only those deposited during the past 60 million years are important for groundwater resources (FDEP 2006). The surface waters of the region are a valuable resource and generally support an abundance of wildlife and aquatic life. Water quality problems found in some areas of the region are high concentrations of nutrients and coliform bacteria. Low dissolved oxygen levels occur, but less frequently. Probable causes of these problems are domestic and industrial waste discharges, natural swamp drainage and urban and agricultural runoff.

The Florida Department of Health's (FDOH) "Florida Healthy Beaches Program" conducts beach water sampling for enterococci and fecal coliform bacteria for 34 coastal Florida counties, including Escambia County, and reporting the results to the public every week. Big Lagoon State Park is the closest water quality testing location to Perdido Key State Park. Based on data collected by the Healthy Beaches Program, Big Lagoon State Park has experienced "good" water quality from September 2012 through September 2013 (FDOH 2013). "Good" water quality is defined as water that has between 0 to 35 colony-forming units of Enterococcus per 100 ml of water. The proposed project is not anticipated to require authorization by the U.S. Army Corps of Engineers pursuant to the Clean Water Act Section 404 and/or Rivers and Harbors Act (CWA/RHA).

Environmental Consequences

The project would have a minimal short-term negative impact on hydrology and water quality with the disturbance of sand/soils and minor resulting changes in topography that would be limited to the construction period. All appropriate permits would be obtained prior to begin of construction and all conditions set forth would be followed. After construction is complete, no long-term impacts are anticipated as the project would take place within the existing footprint of structures at the Perdido Key boardwalks. Impacts to hydrology and water quality would be short-term and minor.

12.13.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

Air quality and greenhouse gas (GHG) emissions at the site are affected by the nearby Perdido Key Drive, parking areas adjacent to the boardwalks, nearby residential development in the area, and boat traffic in the Gulf of Mexico and Old River. Air quality within the Florida panhandle is in attainment with the National Ambient Air Quality Standards (USEPA 2013). To determine if an area meets the ozone standard in 2012, data from 2009, 2010 and 2011 is needed to determine an area's attainment status with the 8-hr ozone standard. If the average is higher than 75 parts per billion, the area would not meet the ozone standard. In Escambia County, Florida, the 2012 year-to-date 3 year average is 73 parts per billion, thus meeting attainment status (FDEP 2013).

Environmental Consequences

Construction activities would have a short-term moderate negative impact on air quality and GHG emissions at the site. During construction activities, use of construction equipment, including heavy machinery (including a Bobcat and a tractor trailer) and handheld tools, would likely increase emissions at the project site. However, construction would be relatively short in duration and no long-term impacts to air quality or GHG emissions are expected to result from this project.

The following table (Table 12-20) provides GHG emissions estimates for the Bobcat and tractor trailer, which would likely be the only heavy equipment used for this project. The Bobcat emission total is based on an estimated 480 hours of operation over the life of the project (8 hours a day, five days a week, for 3 months). The tractor trailer emission total is based on 80 hours of operation (based on the estimation that it would be used twice per week, for 5 months). A "minor impact" on air quality can be determined if the contributions to GHG of this project are measurable, but fall below 25,000 metric ton/year of CO2 or its equivalent.

Table 12-20. Estimated greenhouse gas emissions for equipment to be used.

EQUIPMENT[9]	CO2 (METRIC TONS)[10]	CH4 (CO2E) (METRIC TONS)[11]	NOX (CO2E) (METRIC TONS)	TOTAL CO2E (METRIC TONS)
Bobcat	21	0.012	0.12	21
Tractor Trailer	3.4[12]	0.002	0.02	3.4
TOTAL	24.4	0.014	0.14	24.4

Based on Table 12-20, no long-term impact to air quality or GHG emissions would result from this restoration project because contributions to GHGs fall below the 25,000 metric ton/year threshold.

12.13.5.2.4 Noise

Affected Resources

The natural ambient soundscape is the aggregate of all the natural sounds that occur in the Perdido Key State Park area. The natural sounds occurring in the area include those generated by wind, waves, and. Soundscapes in the Perdido Key State Park area also include the sound generated by the nearby residential development, traffic on the nearby Perdido Key Drive, parking areas adjacent to the boardwalks, boat traffic on the Gulf of Mexico and Old River, and by military aircraft operations (Pensacola Naval Air Station) (USFWS 2011).

[9] Emissions assumptions for all equipment based on 8 hours of operation.

[10] CO_2 emissions assumptions for diesel and gasoline engines based on USEPA 2009.

[11] CH_4 and NOx emissions assumptions and CO_2e calculations based on USEPA 2011.

[12] Construction equipment emission factors based on USEPA NONROAD emission factors for 250 hp pieces of equipment. Data was accessed through the California Environmental Quality Act Roadway Construction Emissions Model.

Environmental Consequences

Construction activities would have moderate negative impacts. Use of construction equipment (Bobcat and tractor trailer) and handheld tools would increase the amount of noise at the site. No long-term impacts to noise are expected after construction work is complete.

12.13.5.3 Biological Environment

12.13.5.3.1 Living Coastal and Marine Resources

Natural Communities

Affected Resources

Beach dune

From a habitat and endangered species perspective, this is by far the most important and sensitive community type on the park. The dunes are fragile and very easily damaged by foot traffic. Unfortunately, many unauthorized trails traverse the dune fields from the highway to the beach all along the 1.4-mile length of the park. Deeply rutted foot trails have grown wide and are subject to wind erosion, fragmenting the habitat. The beach dunes are the main habitat of the Perdido Key beach mouse, one of the most critically endangered mammals on earth. This habitat is currently in fair condition and should improve as protective measures are implemented and enforced (FDEP 2006).

Hurricane Frederick removed a vast amount of beach dune from the area in 1979. Hurricane Opal caused increased damage in 1995. Recent erosion from Hurricane Ivan in 2004 and multiple storms in 2005 further set back dune recovery. The entire primary dune field and the majority of the secondary dunes were lost (FDEP 2006).

Coastal Strand

The coastal strand begins just south of the highway, north to the areas defined as mesic flatwoods. Perhaps calling this community “gulf coastal strand” may be more descriptive and specific to this unique and quickly disappearing community. Beach mice occur in this habitat and populate most all of this habitat type at this park (FDEP 2006).

Marine unconsolidated substrate

This is essentially from the waterline to the toe of the primary dunes. This is an important foraging area for many shorebirds. This is a highly dynamic area and is heavily used by the public for swimming and sunbathing. Most of the use of this park takes place in this area. Loggerhead sea turtles mainly use this portion of the beach for nesting. Hurricane Opal (1995) and Hurricane Ivan (2004) caused severe erosion at this unit. Several feet of beach were lost all across the key.

Environmental Consequences

Construction activities at the site would have a temporary minor negative impact on these natural communities. The presence of construction crews and use of heavy equipment would likely temporarily adversely impact these natural communities, but the long-term impacts would be beneficial. Construction could take up to 6 months to complete, and would likely occur from October through early March.

After work is completed, the project would have a positive impact on these natural communities. The project would be designed to improve the function of the existing boardwalk to reduce the impact of the boardwalk and visitors on the dune habitat, which would benefit dune vegetation and wildlife. Furthermore, the introduction of invasive species is not perceived as a high risk for this project, standard BMPs for construction would be used to prevent the introduction of invasive species.

12.13.5.4 Protected Species

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

Affected Resources

The Trusteeshave reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS. For this, the Trusteesfirst reviewed the species list for Escambia County, Florida.[13] Table 12-21 present a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

Table 12-21. Potential Impacts to Species/Critical Habitats managed by USFWS

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle, Hawksbill turtle, Kemp's ridley turtle; Leatherback turtle, Loggerhead turtle	The main risk to sea turtles during implementation of this project would come should work be conducted during the turtle nesting and hatching season from approximately May through October when turtles, and to a greater extent their nests and hatchlings could be harmed or killed as a result of materials being conveyed along the beach and running over nests or hatchlings. Due to the conservation measures, the Trusteesexpect impacts to all life stages of sea turtles to be minimized such that disturbance and potential for harm are minimized such that the impacts are insignificant and discountable. Furthermore, it is planned that all boardwalk work (i.e., majority of any heavy equipment use) would occur prior to turtle nesting season, and prior to heavy human use (generally during the late fall, winter, and early spring).. No lighting will be installed. No designated critical habitat for the green, leatherback, or hawksbill sea turtles occurs within the action area. No critical habitat has been designated for the Kemp's ridley sea turtle; therefore, none will be adversely affected or modified.
Loggerhead proposed critical habitat	The project area overlaps with the currently proposed critical habitat area LOGG-N-33 encompassing nearshore reproductive habitat in Florida for Northwest Atlantic Distinct Population Segment of the loggerhead sea turtle as these habitats are terrestrial (i.e., beaches and shorelines) ((78 FR 18000) Department of the Interior, 2013). Primary Constituent Elements (PCEs) for proposed loggerhead critical habitat include: 1) Suitable nesting beach habitat that: (a) has relatively unimpeded nearshore access from the ocean to the beach for nesting females and from the beach to the ocean for both post-nesting females and hatchlings and (b) is located above mean high water to avoid being inundated frequently by high tides. 2) Sand that: (a)

[13] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
	allows for suitable nest construction, (b) is suitable for facilitating gas diffusion conducive to embryo development, and (c) is able to develop and maintain temperatures and moisture content conducive to embryo development. 3) Suitable nesting beach habitat with sufficient darkness to ensure that nesting turtles are not deterred from emerging onto the beach and hatchlings and post-nesting females orient to the sea. Temporary use of heavy equipment to construct walkovers or transport plants during restoration activities could change sand characteristics important to nest construction and embryo development in the immediate area of work. However, conservation measures should minimize impacts such that impacts to the PCE's in the immediate area are short-term (1 season or less) and wind and storm conditions should restore natural properties with each storm event prior to the next nesting season. Furthermore, the walkovers (i.e., majority of any heavy equipment use) will be constructed prior to the turtle nesting season and prior to the heavy human use period (during the late fall, winter, and early spring) thereby avoiding potential impacts during the nesting season which should allow time for the beach to recover prior to the next nesting season. Though engineering designs are not complete, it is likely that walkovers will be extended further on the beach due to migration of the dunes since the old boardwalks were constructed and to meet ADA standards. These short extensions would not impact nearshore access in the immediate area. No lighting will be installed. In addition, the relative footprint of all driving and construction will be minimized so that PCE's outside the immediate area of work are unaffected. Dune restoration may enhance beaches for nesting by helping to establish dunes which can block light from adjacent areas. Based upon the implementation of the conservation measures, no adverse modification of proposed loggerhead critical habitat is anticipated.
Perdido Key beach mouse	The main risk to the Perdido Key beach mouse is the collapse of burrows during construction which can result in abandonment of the burrow by the adults leading to potential harm or mortality and mortality of any young within the burrow, and increased risk of predation on adults. Visitor use is not expected to increase as a result of the proposed project therefore no indirect impacts from visitor use (increased predation) are expected due to the proposed project. Because of the conservation measures (including those for critical habitat), the Trusteesbelieve impacts to beach mice are insignificant and discountable.
Perdido Key beach mouse critical habitat	The project area overlaps with Perdido Key Beach Mouse Critical Habitat Units 2 (West Perdido Key Unit – 114 acres) and 3 (Perdido Key State Park Unit – 238 acres). PCE's are: 1) A contiguous mosaic of primary, secondary scrub vegetation, and dune structure, with a balanced level of competition and predation and few or no competitive or predaceous nonnative species present, that collectively provide foraging opportunities, cover, and burrow sites; 2) Primary and secondary dunes, generally dominated by sea oats that, despite occasional temporary impacts and reconfiguration from tropical storms and hurricanes, provide abundant food resources, burrow sites, and protection from predators; 3) Scrub dunes, generally dominated by scrub oaks, that provide food resources and burrow sites, and provide elevated refugia during and after intense flooding due to rainfall and/or hurricane induced storm surge; 4) Functional, unobstructed habitat connections that facilitate genetic exchange, dispersal, natural exploratory movements, and recolonization of locally extirpated areas; and 5) A natural light regime within the coastal dune ecosystem, compatible with the nocturnal activity of beach mice, necessary for normal behavior, growth and viability of all life stages. The proposed project is not expected to negatively impact PCE's but rather may benefit PCE's. The existing boardwalks and lack of dunes in the area could be limiting the amount of contiguous habitat, food resources, burrow sites, and the boardwalks may be causing obstructions due to their low height. Dune restoration may contribute to building more functionality in PCE's 1,2, 3 and 4: raising of boardwalks should allow for unobstructed movements by mice; and lengthening boardwalks will help prevent dune erosion (pathway "fanning") from general visitor use thereby reducing changes to burrow sites, food resources, and susceptibility to hurricane/storm impacts. No lighting will be installed as a part of the proposed project. Based upon the implementation of the conservation measures, no adverse modification of critical habitat is anticipated.

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Piping plover	The main risk to Piping plovers is from human disturbance while resting and foraging in habitats adjacent to work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the plovers to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The Trusteesdo not expect an increase in visitor use from the proposed project; therefore, no indirect impacts are expected. Piping plover critical habitat is not designated in or near the action.
Red knot	The main risk to Red knots is from human disturbance while resting and foraging in habitats adjacent to work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the red knots to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The Trusteesdo not expect an increase in visitor use from the proposed project; therefore, no indirect impacts are expected.

Based on the Trustees'reviews of project materials (Spring 2013) in coordination with representatives from NOAA's Protected Resource Division (PRD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project falls outside of NMFS Endangered Species Act (ESA) jurisdiction, as it does not contain suitable habitat for species managed by NMFS. As a result, the project did not require further ESA evaluation from NOAA.

Additional information on some of the species described above is provided below.

Perdido Key Beach Mouse

The Perdido Key beach mouse is one of the rarest mammals in the world. These mice only occur on Perdido Key, within the Johnson Beach unit of Gulf Islands National Seashore and now on Perdido Key State Park. As of March 2006, beach mice numbered less than 50 individuals, which is less than half the number known to exist in September 2002 prior to Hurricane Ivan. The population fluctuates a great deal. In the summer of 2001, only a handful of mice were known to inhabit the park, and only then by the presence of tracks (FDEP 2006).

The continued existence of the beach mouse at this park is threatened by the intermittent presence of a rather high density of feral and free ranging cats. Predation by cats is considered the most significant reason that mice became extirpated here in the early 1980s. Habitat quality has fluctuated throughout 2003 and 2004 (FDEP 2006).

Artificial lighting at night is a problem that is negatively affecting beach mice. The mice prefer dark beaches, and tend to increase surface activity on darker nights, near the new moon. The added light can increase the success predators have catching the mice, and alter the normal behavior of the mice. Trapping data has shown that beach mice generally do not use areas of the park affected most by the artificial lighting. These areas are typically along the east and west boundaries of the park and along the edges of the highway where the lighting is more prevalent (FDEP 2006).

Sea Turtles

There are five species of endangered or threatened sea turtles that may occur or have the potential to occur in the project area. These include green turtle, hawksbill turtle, Kemp's ridley turtle, leatherback turtle, and loggerhead turtle. Sea turtles forage in the waters of the coastal Florida panhandle region

and have the potential to occur in the waters where in-water work is proposed. The project site contains suitable sea turtle nesting habitat along the sandy beach and loggerheads commonly nest in this area.

Piping Plover

The sandy beaches and shorelines adjacent to the project area offer suitable foraging and resting habitat for the piping plover during the winter migratory season, and piping plover may forage in the shallow waters of the project area. Natural shorelines in the proposed project vicinity provide suitable winter migration resting habitat for the piping plover. Piping plover wintering habitat includes beaches, mudflats, and sandflats, as well as barrier island beaches and spoil islands (Haig 1992 as cited by USFWS 2013). On the Gulf Coast, preferred foraging areas are associated with wider beaches, mudflats, and small inlets (USFWS 2013).

Red Knot

The red knot, a federal proposed species, uses the state of Florida both for wintering habitat and migration stopover habitat for those that continue to migrate down to specific wintering locations in South America (Niles et al. 2008) and could be present in the project area. Wintering and migrating red knots forage along sandy beaches, tidal mudflats, saltmarshes, and peat banks (Harrington 2001). Observations indicate that red knots also forage on oyster reef and exposed bay bottoms, and roost on high sand flats, reefs, and other sites protected from high tides (Niles et al. 2008). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Threats to wintering and stopover habitat in Florida include shoreline development, hardening, dredging, deposition, and beach raking (Niles et al. 2008).

Essential Fish Habitat

Based on the Trustees'reviews of project materials (Spring 2013) in coordination with representatives from NOAA's Habitat Conservation Division (HCD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project will not affect EFH because there is no EFH in the project area. As a result, the project did not require further EFH evaluation.

Migratory Birds

The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711) decreed that all migratory birds and their parts (including eggs, nests, and feathers) were fully protected. The migratory bird species protected by the Act are listed in 50 C.F.R. 10.13. More than 250 species of birds have been reported as migratory or permanent residents within the Florida panhandle, several of which breed there as well. These birds can be grouped generally as (1) species that occur year-round, both nesting and overwintering, (2) species that nest during the warm season and overwinter to the south, (3) species that overwinter and nest further north, and (4) species that pass through during spring migrations to more northern nesting sites and/or during fall migrations to overwintering areas. Different populations of the same species sometimes exhibit more than one type of migratory behavior.

The DOI review also considered potential impacts to migratory birds. A summary of the potential impacts to different migratory bird groups is presented in Table 12-22.

Table 12-22. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Shorebirds	Foraging, feeding, resting, nesting	Shorebirds nest, forage, feed, and rest in the types of habitats consistent with some of the shoreline areas near the proposed project. As such, they may be impacted locally and temporarily by the project.
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Resting, roosting, nesting	Seabirds forage in water and rest/roost in terrestrial habitats including dunes. Project activity could startle resting birds; however, impacts to roosting birds are not expected because activities will occur during the day.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in Table 12-23.

Table 12-23. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Shorebirds	The Trusteesexpect foraging and resting birds would be able to move to another nearby location to continue foraging and resting. If project activities occur during shorebird nesting season (February 15 to August 31), the FWC will be contacted to obtain the most recent guidance to protect nesting shorebirds or rookeries and their recommendations will be implemented. The Panama City Field Office will be contacted regarding dune plantings to balance habitat for listed and migratory birds and beach mouse.
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care will be taken to minimize noise and physical disruptions near areas where foraging or resting birds are encountered. All disturbances will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity, which they will have. Roosting should not be impacted because the project will occur during daylight hours only. Nesting should not be impacted because the project will not occur near nesting habitats.

Bald Eagles

The bald eagle was delisted by the USFWS and is not listed as threatened or endangered by the FWC. The bald eagle is, however, protected by state law pursuant to 68A-16, Fla. Admin. Code and by the U.S. government under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles feed on fish and other readily available mammalian and avian species and are dependent on large, open expanses of water for foraging habitat. In Florida, conservation measures to protect active nest sites during nesting season must be considered to reduce potential disturbances of certain project activities. If bald eagles are found nesting within 660 feet of a proposed construction area, then activities would need to occur outside of nesting season or coordination with the USFWS would occur to determine if a permit is needed, and Florida's *Bald Eagle Management Plan* guidelines would be followed (FWC 2008). There are no known bald eagle nests within or near the project site.

Environmental Consequences

Protected Species

Considering the nature of the potential project and the species/critical habitats that could be affected, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in Table 12-24 below.

Table 12-24. Conservation measures to be implemented in order to minimize impacts to species/critical habitats managed by DOI

SPECIES	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Green turtle, Hawksbill turtle, Kemp's ridley turtle, Leatherback turtle, Loggerhead turtle	No lighting will be installed on the boardwalks. Should work be undertaken between May 1 and October 31 the following conservation measures will be followed: Work completed outside of this time period should not require these measures. • All construction personnel will be notified of the potential presence of sea turtles and reminded of the criminal and civil penalties associated with harassing, harming, or killing sea turtles (all life stages). • The local sea turtle nesting surveyor will conduct daily sea turtle nesting surveys will assess the need for the relocation of sea turtle nests that could be affected by the project construction prior to project implementation each day • If a sea turtle (either adult or hatchling) is observed, maintain at least 200 feet between the turtle and personnel. • All actions shall observe a 10-foot buffer from marked sea turtle nests. Between May 1 and August 31[14], actions with mechanized equipment or vehicles shall not begin prior to 9:00 am to ensure sea turtle monitoring surveys are completed for the day. • If altered, beach topography shall be restored in all areas to the natural beach profile by 20:00 hours each day. Restoring beach topography includes raking of tire ruts, filling pits or holes. • Avoid driving over the wrack line or areas of dense seaweed, as these habitats may contain sea turtle hatchings or baby birds that are difficult to see.
Loggerhead proposed critical habitat	To maintain PCE's for proposed loggerhead critical habitat, the following measures shall be implemented (regardless of seasonality): • All construction personnel will be notified of the presence of proposed critical habitat and reminded to avoid impacting it otherwise additional restoration may be necessary. • The nearest, existing staging, access and egress areas, travel corridors, pathways, and roadways shall be used (including those provided by the State, local governments, land managers, trustee, or private property owner, with proper permissions). • No new staging areas, access or egress, or travel corridors shall be created. • Minimize vegetation removal. • If driving equipment or vehicles on the beach, enter at designated access, proceed directly to the hard-packed sand near or below the high tide line and stay below the tide line when driving long distances. • Avoid driving on the upper beach whenever possible, and never drive over any dunes or beach vegetation. • Use the smallest footprint possible to complete the proposed project. • If altered, beach topography shall be restored in all areas to the natural beach profile by 20:00 hours each day. Restoring beach topography includes raking of tire ruts, filling pits or holes.

[14] Turtle *nesting* season is May 1 to August 31, while turtle *hatching* continues until October 31. The remaining turtle BMPs will be implemented May 1 through October 31 and BMPs for proposed critical habitat will be implemented all year.

SPECIES	CONSERVATION MEASURES TO MINIMIZE IMPACTS
	• No lighting will be installed.

Perdido Key beach mouse	Conservation measures that will be implemented to avoid impacts to the Perdido Key Beach Mouse include:
	
	• All construction personnel will be notified of the potential presence of Perdido Key Beach Mice and reminded of the criminal and civil penalties associated with harassing, injuring, or killing Perdido Key Beach Mice.
	• To minimize impacts to Perdido Key beach mice in burrows, a qualified, permitted, biologist will survey the project site before work commences and flag potential burrows and tracks so that they can be avoided.
	• Construction noise will be kept to the minimum feasible.
	• Construction will occur during the day to minimize disturbance to nocturnal patterns.
	• Equipment, vehicles, and project debris will not be stored in a manner or location where it could be colonized by mice.
	  ○ Prior to bringing any equipment (including personal gear, machinery, vehicles or vessels) to the work site, inspect each item for mud or soil, seeds, and vegetation. If present, the equipment, vehicles, or personal gear shall be cleaned until they are free from mud, soil, seeds, and vegetation. This inspection will occur each time equipment, vehicles, and personal gear are being prepared to go to a site or prior to transferring between sites to avoid spreading exotic, nuisance species.
	  ○ Inspect sites periodically to identify and control new colonies/individuals of an invasive species not previously observed prior to construction.
	  ○ Remove trash or anything that would attract nuisance wildlife to work areas daily.
	• Project related trash or debris shall not be allowed to blow into open water, onto beaches or in the dunes.
	• Appropriate waste/trash receptacles will be installed and maintained at boardwalks so that predators are not attracted to the area.

Perdido Key beach mouse critical habitat	Conservation measures that will be implemented to avoid impacts to the Perdido Key Beach Mouse critical habitat include: • The project will occur in very localized locations for very short periods of time, allowing the mosaic of primary, secondary scrub vegetation and dune structure to remain unchanged or increase after implementation. • If native dune plants are destroyed during the project, appropriate native plants will be planted in the same location to minimize impacts to the vegetative composition of the area. The Panama City Field Office will be contacted regarding dune plantings to balance habitat for listed and migratory birds and beach mouse. • If necessary (due to food source removal during construction and growing periods for replacement plants), supplemental beach mouse food sources will be provided. • Project work will only occur during daylight hours. As such it will not alter the natural light regime of the area.
Piping plover and red knot	If construction occurs within the period from August to May: shorebird surveys will be conducted in the project area; and within the project area a 300-foot wide buffer zone where either species congregates will be established. Any and all construction will be prohibited in the buffer zone until the individuals move from the area of their own volition. The Panama City Field Office will be contacted regarding dune plantings to balance habitat for listed and migratory birds and beach mouse.

SPECIES	CONSERVATION MEASURES TO MINIMIZE IMPACTS
All	In addition to the identified species specific measures, the new dune walkovers associated with the Perdido Key State Park Beach Boardwalk Improvements action will be constructed in a manner consistent with the recent guidance for such work issued by the USFWS Panama City field office (USFWS, 2013). In addition: · Dune restoration should mimic natural dunes including swales with and without vegetation. · ATVs should stay out of the dunes and as low to the water line as possible. Plants may have to be walked up to the planting area from the ATV travel path. · Construction of the dune walkovers should be consistent with the Trustees'existing guidelines. · Prior to conducting the restoration, contact PCFO about the dune plantings (especially to avoid least tern nesting areas – this measure is within the mig bird section, but the Trusteesdid not specifically mention least tern. Least terns will not nest in veg, so the Trusteesshould not plant their nesting area.) . Further, the following items were noted: · It may be necessary to use a fertilizer to jump start plant growth. · If sand fencing is used, it should be moved up regularly as the dune grows and removed as soon as the dune and plants are large enough to capture sand. · Use some larger plants mixed with the typically used smaller plants to help capture sand immediately. · Post and rope should be used and maintained around the entire restoration area to keep people from affecting the restoration.

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On April 4, 2014 the review of potential impacts to species managed by USFWS was completed (McClain, 2014). The USFWS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect, five species of sea turtles in terrestrial habitats (green, hawksbill, Kemp's ridley, leatherback, and loggerhead), Perdido Key beach mouse, piping plover, and red knot (if listed)based upon the successful implementation of the conservation measures in Table 12-24 above . The USFWS also concurred with the Trustees'determination that the project will not adversely modify or destroy critical habitat for the Perdido Key beach mouse or destroy critical terrestrial habitat for the loggerhead sea turtle (if designated).

Migratory Birds and Bald Eagle

Bald eagles are not present at the project location so will not be affected.

At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

Invasive Species

Affected Resources

Non-native invasive species could alter the existing terrestrial or aquatic ecosystem within, and possible expand out into adjacent areas after the initial introduction. The invasive species threat, once realized, could result in economic damages. Prevention is ecologically responsible and economically sound.

Chapter 3 described more about the regulations addressing invasive species, pathways, impacts, and prevention. At this time specific invasive species that may be present on the project site or could be introduced through the project have not yet been identified.

Environmental Consequences

Best Management Practices (BMPs) to control the spread of any invasive species present, and prevent the introduction of new invasive species due to the project will be implemented. In general, best management practices would primarily address risk associated with vectors (e.g., construction equipment, personal protective equipment, delivery services, foot traffic, vehicles/ vessels, shipping material). There are many resources that provide procedures for disinfection, pest-free storage, monitoring methods, evaluation techniques, and general guidelines for integrated pest management that can be prescribed based upon specific site conditions and vectors anticipated. In addition, to best management practices, outreach and educational materials may be provided to project workers and potential users/visitors. Other measures that could be implemented are identified in the Chapter 6 Appendix. Due to the implementation of BMPs, the Trusteesexpect impacts due to invasive species introduction and spread to be short term and minor.

12.13.5.5 Human Uses and Socioeconomics

12.13.5.5.1 Socioeconomics and Environmental Justice

Affected Resources

Escambia County is located in the extreme northwestern corner of the State of Florida, bordered on the west and north by Alabama; on the east by Santa Rosa County, Florida; and on the south by the Gulf of Mexico. The county encompasses 661 square miles, or 420,480 acres, with an additional 64,000 acres of water area. The population of Escambia County, per U.S. Census data (US Census 2013), is currently estimated at 297,619. Table 12-25 provides a brief demographic overview of Escambia County, Florida.

Leisure and recreational pursuits are on the increase on Perdido Key, along with northwest Florida. The impact of recreation and tourism on the economy continues to expand. Recreational visits to state and national parks grew by an estimated 300,000 visitors from 2003 to 2004. In northwest Florida, visitor days for national parks and state parks were up 5 percent from 2003-2004. Taxable sales of transient facilities outpaced Florida's growth rate (7.7 % v. 6.3%). Employment and payroll for the tourism industry was also up (0.8 % and 2.4%, respectively) (USFWS 2011).

Environmental Consequences

Improving site access characteristics is likely to improve the experience for those using the facilities in the future. The extent to which the improvements may support new trips to the state park or region, or induce shifts in location for recreation from other local beaches is difficult to quantify.

The proposed project is expected to have short-term, beneficial impacts on socioeconomics for project area and adjacent areas, based on a slight increase in the workforce required to perform the boardwalk improvements. The exact number of persons to be employed by this project is undetermined, but would be estimated to be approximately 12 persons.

12.13.5.5.2 Cultural Resources

Affected Resources

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Environmental Consequences

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

12.13.5.5.3 Infrastructure

Affected Resources

There is no major infrastructure at the site. The boardwalks are near Perdido Key Drive but are located in Perdido Key State Park, away from developed areas.

Table 12-25. Demographic information for Escambia County, Florida (US Census 2013).

U.S. CENSUS DATA QUICKFACTS	ESCAMBIA COUNTY
Population, percent change, April 1, 2010 to July 1, 2012	1.7%
Population, 2010	297,619
Persons under 5 years, percent, 2012	6.2%
Persons under 18 years, percent, 2012	21.1%
Persons 65 years and over, percent, 2012	15.2%
Female persons, percent, 2012	50.5%
White alone, percent, 2012 (a)	70.1%
Black or African American alone, percent, 2012 (a)	22.9%
American Indian and Alaska Native alone, percent, 2012 (a)	0.9%
Asian alone, percent, 2012 (a)	2.9%
Native Hawaiian and Other Pacific Islander alone, percent, 2012 (a)	0.2%
Two or More Races, percent, 2012	3.0%
Hispanic or Latino, percent, 2012 (b)	5.1%
White alone, not Hispanic or Latino, percent, 2012	66.0%
Living in same house 1 year & over, percent, 2007-2011	80.2%
Foreign born persons, percent, 2007-2011	5.9%
Median value of owner-occupied housing units, 2007-2011	$145,000
Households, 2007-2011	111,928
Persons per household, 2007-2011	2.47
Per capita money income in the past 12 months (2011 dollars), 2007-2011	$23,773
Median household income, 2007-2011	$43,707
Persons below poverty level, percent, 2007-2011	16.9%

(a) Includes persons reporting only one race.

(b) Hispanics may be of any race, so also are included in applicable race categories.

Environmental Consequences

Replacement of the boardwalks at Perdido Key State Park would have no impact on infrastructure. The project includes replacing existing boardwalk structures, within the existing footprint, and no major infrastructure changes would be made.

12.13.5.5.4 Land and Marine Management

Affected Resources

The project area is part of the Perdido Key State Park and is not in a developed area. Surrounding land uses include un-improved areas of the park and some small residential areas.

Environmental Consequences

Replacement of the boardwalks at Perdido Key State Park is anticipated not to have an impact on land and marine management because changes at the site are limited to replacing and improving existing structures.

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS (Federal Trustees 2013). The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process (Milligan 2014).

12.13.5.5.5 Aesthetics and Visual Resources

Affected Resources

Perdido Key State Park is very scenic, especially when contrasted with the new condominium developments and commercial businesses that are rapidly appearing on Perdido Key. Views from the park offer open vistas of the Gulf of Mexico and Old River, with some intruding views of adjacent development. The aesthetic and visual resources at the site include natural dune, beach, and Gulf of Mexico habitat.

Environmental Consequences

Replacement of the boardwalks at Perdido Key State Park would have no negative impact on aesthetics and visual resources because no changes to the viewscape are planned.

Replacement of the boardwalks at Perdido Key State Park would have a long-term beneficial impact on aesthetics and visual resources. The current boardwalks are in a rundown and poorly managed state, which has poor aesthetics in addition to poor functionality. The improved boardwalks would improve the look of the walkways and the natural dune habitat in which they are situated.

12.13.5.5.6 Tourism and Recreational Use

Affected Resources

The project site is currently a tourist and recreational user destination. The dune walkovers provide users with access to the beach and provide opportunities for observing natural dune and beach habitat and wildlife.

Environmental Consequences

The project would have a long-term beneficial impact on tourist and recreational user enjoyment of the site. The project would replace dune walkovers to improve conservation of dune habitat and improve the safety and accessibility of the site structures. The boardwalk improvement would be expected to ease handicap visitor access to the beach, addressing a current limit on who presently can use the resource.

12.13.5.5.7 Public Health and Safety and Shoreline Protection

Affected Resources

Public health and safety and shoreline protection at the site are of high quality. The site is part of the Perdido Key State Park and is managed to maximize health and safety for human use and the environment.

Environmental Consequences

Replacement of the boardwalks at Perdido Key State Park would have a long-term beneficial impact on public health and safety. The work is designed to improve access to the beach by improving the condition of the boardwalk structures. The project would have no impact on shoreline protection, because no work is planned for the shoreline, and current management practices would not be altered by the project.

12.13.6 Summary and Next Steps

The proposed Perdido Key project would improve a number of existing boardwalks in Perdido Key in Escambia County. The proposed improvements include removing and replacing six existing boardwalks leading to the beach from two public access areas. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would enhance and/or increase recreational beach use opportunities by improving beach access. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

12.13.7 References

Federal Trustees, 2013. Letter to Kelly Samek, Coastal Program Administrator, State of Florida, December 12. Letter submitting determination for State review of consistency of Phase III early restoration actions for the Deepwater Horizon oil spill with Florida's approved Coastal Management Program.

Florida Department of Environmental Protection (FDEP)

2006 Perdido Key State Park, Unit Management Plan. State of Florida, Department of Environmental Protection, Division of Recreation and Parks. October 13, 2006.

2013 Air Quality Monitoring for Wakulla County, Florida. Accessed online at: http://appprod.dep.state.fl.us/air/flaqs/selectreport.asp

McClain, D. 2014. Memorandum to Field Supervisor, Panama City Ecological Services Office, Subject Informal Consultation and Conference Request for the Proposed Perdido Key Dune Restoration and Perdido Key State Park Beach Boardwalk Improvements, Florida. Sent February, 24. Concurrence signed by Donald Imm, April 4, 2014.

Milligan, L. 2014. Letter to Harriet Deal, U.S. Department of the Interior, February 28, 2014, Re: Florida Coastal Management Program Consistency for Draft Phase III ERP/PEIS projects.

National Marine Fisheries Service (NMFS)

2006 Sea Turtle and Smalltooth Sawfish Construction Conditions. March 23, 2006. Accessed online at: http://www.saj.usace.army.mil/Portals/44/docs/regulatory/sourcebook/other_permitting_factors/inwaterWorkSeaTurtle032306.pdf

United States Census Bureau (US Census)

2013 State and County Quickfacts for Escambia County, Florida. Access online at: http://quickfacts.census.gov/qfd/states/12/12033.html

U.S. Department of the Interior.

2013. 50 CFR Part 17: Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northwest Atlantic Ocean District Population Segment of the Loggerhead Sea Turtle (*Caretta caretta*). Proposed Rule. Federal Register p. 18000-18082. March 25.

United States Environmental Protection Agency (USEPA)

2013 Status of State Implementation Plan (SIP) Requirements for Designated Areas. Accessed online at: http://www.epa.gov/airquality/urbanair/sipstatus/reports/fl_areabypoll.html

United States Fish and Wildlife Service (USFWS).

2013. Conservation Measures for Dune Walkover Construction. Unpublished Guidance prepared by Panama City Ecological Services Field Office.

12.14 Big Lagoon State Park Boat Ramp Improvement: Project Description

12.14.1 Project Summary

The proposed Big Lagoon State Park project would involve enhancing an existing boat ramp and surrounding facilities in the Big Lagoon State Park in Escambia County. These improvements would include adding an additional lane to the boat ramp, expanding boat trailer parking, improving traffic circulation at the boat ramp, and providing a new restroom facility to connect the park to the Emerald Coast Utility Authority (ECUA) regional sanitary sewer collection system. The total estimated cost for this project is $1,483,020.

12.14.2 Background and Project Description

The Trustees propose to improve and enhance an existing public ramp at Big Lagoon State Park (see

Figure 12-25 for project location). The objective of the proposed Big Lagoon State Park Boat Ramp Improvement project is to enhance and/or increase recreational boating and fishing opportunities by improving the existing boat ramp area. The restoration work proposed includes adding an additional lane to the boat ramp, expanding boat trailer parking, improving traffic circulation at the boat ramp, and providing a new restroom facility to connect the park to the ECUA regional sanitary sewer collection system.

12.14.3 Evaluation Criteria

This proposed project meets the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and related response actions, the public's access to and enjoyment of the natural resources along Florida's Panhandle was denied or severely restricted. The proposed Big Lagoon State Park Boat Ramp Improvements project is intended to enhance and/or increase recreational boating and fishing opportunities by improving the existing boat ramp area. This project would enhance and/or increase opportunities for the public's use and enjoyment of the natural resources, helping to offset adverse impacts to such uses that resulted from the Spill. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

The project is technically feasible and utilizes proven techniques with established methods and documented results and can be implemented with minimal delay. Agencies have successfully implemented projects of similar scope throughout Florida over many years. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Additionally, the cost estimates are based on similar past projects and therefore the project can be conducted at a reasonable cost. See C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.14, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration with the exception of infrastructure which would be minor, localized and long term. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.14 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). Finally, this proposed project is not anticipated to negatively affect regional ecological restoration and is therefore not inconsistent with the long-term restoration needs of the State of Florida. See Section 6d of the Framework Agreement.

Figure 12-25. Location of envisioned Big Lagoon Boat Ramp Project.

Many recreational use projects, including ones similar to this project, have been submitted as restoration projects on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhoriozonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Big Lagoon State Park Boat Ramp Improvement project also meets the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by response and SCAT activities for the Spill.

12.14.4 Performance Criteria, Monitoring and Maintenance

As part of the project cost, monitoring will be conducted to ensure project plans and designs were correctly implemented. Monitoring has been designed around the project goals and objectives. The project objective is to enhance and/or increase recreational boating and fishing opportunities by improving the existing boat ramp area. Performance monitoring will evaluate: 1) the construction of an additional lane to the boat ramp; 2) the expansion of the boat trailer parking; 3) the improvement to the traffic circulation at the boat ramp; and 4) the construction of a new restroom facility that will be connected the park to the Emerald Coast Utility Authority (ECUA) regional sanitary sewer collection system. Specific success criteria include: 1) the completion of the construction as designed and

permitted, and 2) enhanced and/or increased access is provided to the natural resources, which will be determined by observation that the boat ramp area is open and available.

Long-term monitoring and maintenance of the improved facilities will be completed by Big Lagoon State Park staff as part of their regular public facilities maintenance activities. Corrective actions necessary after completion and signoff of the project will be undertaken by park staff. Funding for this post-construction maintenance is not included in the previously provided value for the project cost and will be accomplished by Big Lagoon State Park.

During and following the post construction performance monitoring period, the State of Florida park staff will monitor the human use activity at the site. Park staff keeps track of visitation and usage at the park and will provide visitation numbers by the month. This use information is kept by the Florida Department of Environmental Protection.

The State of Florida Trustees and the Department of the Interior recognize the need to evaluate the effectiveness of conservation measures designed to avoid or minimize impacts to sensitive species or their habitats. To assess the public's awareness of the educational signage intended to minimize impacts of use associated with the improved facilities, readers will be invited to take an online survey accessed via a QR code on the sign. The Florida Trustees and DOI will determine the adequacy of this method of assessing public awareness six months after the completion of construction. If the online surveying is insufficient, concurrent with the twice annual performance monitoring, and performed by the same party, a survey will be taken of a sample of recreational users at the project location.

12.14.5 Offsets

The Trustees and BP negotiated a BCR of 2.0 for the proposed recreational use project. NRD Offsets are $2,966,040 expressed in present value 2013 dollars to be applied against the monetized value of lost recreational use provided by natural resources injured in Florida, which will be determined by the Trustees' assessment of lost recreational use for the Oil Spill. Please see Chapter 7 of this document (Section 7.2.2) for a description of the methodology used to develop monetized Offsets.[15]

12.14.6 Cost

The total estimated cost to implement this project is $1,483,020. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and contingencies.

[15] For the purposes of applying the NRD Offsets to the calculation of injury after the Trustees' assessment of lost recreational use for the Spill, the Trustees and BP agree as follows:

- The Trustees agree to restate the NRD Offsets in the present value year used in the Trustees' assessment of lost recreational use for the Spill.
- The discount rate and method used to restate the present value of the NRD Offsets will be the same as that used to express the present value of the damages.

12.15 Big Lagoon State Park Boat Ramp Improvement: Environmental Review

The proposed project is intended to improve the quantity and quality of recreational boating in Florida's Pensacola Bay system by enhancing Big Lagoon State Park (referred to hereafter as "the Park") public boat ramp.

12.15.1 Introduction and Background

In April 2011, the Natural Resources Trustees (Trustees) and BP Exploration and Production, Inc. (BP) entered into the *Framework Agreement for Early Restoration Addressing Injuries Resulting from the* Deepwater Horizon *Oil Spill* (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is underway. The Framework Agreement is intended to expedite the start of restoration in the Gulf of Mexico in advance of the completion of the injury assessment process. Early Restoration is not intended to and does not fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects would be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement, the Trustees released a Phase I Early Restoration Plan (ERP) in April 2012, after public review of a draft. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, the National Oceanic and Atmospheric Administration (NOAA) issued a public notice in the *Federal Register* on behalf of the Trustees announcing the development of additional future Early Restoration projects for a Draft Phase III ERP. This boat ramp project was submitted as an ERP on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida. In addition to meeting the evaluation criteria for the Framework Agreement and Oil Pollution Act (OPA), the project meets Florida's criteria that ERPs occur in the eight-county Florida panhandle area that deployed boom and was impacted by the Spill.

The Florida State Parks system offers residents and visitors recreation opportunities and scenic beauty. Improved access and facilities at these parks would promote visitation and park use, inspiring a sense of community, improving outdoor experience and education, and contributing to local economies. Roads, parking areas, trails, picnic facilities, and restrooms compose the main infrastructure through which the general public is able to enjoy state parks. Public boat ramps at the state parks provide local boaters with access to public waterways. Boating access is the basis upon which many types of secondary, water-dependent activities may be enjoyed. These activities offer recreational values, and include fishing, scuba diving, water-skiing, swimming, or simply cruising local waterways under power or sail.

The existing two-lane boat ramp in the Park requires maintenance, is congested, and does not meet the current demand. This project would improve the boat ramp area to expand and enhance its use by Park visitors. It would involve adding an additional lane to the boat ramp, improving traffic circulation at the boat ramp, expanding boat trailer parking, and providing a new restroom facility to handle increasing visitor use.

The boat ramp improvement project is part of an ongoing plan by the Florida State Parks system to enhance and improve the ability of the public to use its resources.

12.15.2 Project Location

The Park is at 12301 Gulf Beach Highway, approximately 10 miles southwest of the city of Pensacola in Escambia County, Florida. The Park is on the northern shoreline and west end of Big Lagoon, just east of the Gulf Beach Highway (State Highway 292) and south of County Route 292A (see Figure 12-26) (Florida Department of Environmental Protection [FDEP] 2013a). Big Lagoon is part of the Pensacola Bay system.

The Park separates the mainland from Perdido Key and the Gulf of Mexico, and consists of approximately 655 upland acres and two bodies of water (the freshwater Long Pond and the saltwater Grand Lagoon Lake). It contains beaches, shallow bays, open woodlands, an observation tower, boardwalks, nature trails, camping areas, picnic areas, an amphitheater, and the boat ramp that provides easy access to Big Lagoon (FDEP 2013a). The Park preserves a natural area along the north shoreline of Big Lagoon and the Intracoastal Waterway, providing wildlife and plant habitat and preserving large wetland expanses.

The boat ramp is in the west portion of the Park, along West Beach (see Figures 12-27 and 12-28 for general location and detail).

12.15.3 Construction and Installation

12.15.3.1 Construction Design

Detailed construction methods and plans have not yet been developed and would be subject to the final design and contractor approach. Most of the project would be upland construction. Standard best management practices (BMPs) for this type of construction with limited in-water work would be used to minimize impacts (e.g., fencing in in-water areas).

Expansions to existing facilities would include adding a lane to the boat ramp and expanding boat trailer parking. Traffic circulation at the boat ramp would also be improved by reconfiguring the launch/tow-out area to accommodate two vehicles at once. One new building, a restroom facility, would be constructed. Construction would require connecting the new restroom to the Emerald Coast Utility Authority (ECUA) regional sanitary sewer collection system. Power access may be upgraded and reconfigured during construction based on final design needs and opportunities. Specific square footage is unknown at this time, but impacts are expected to occur over several acres.

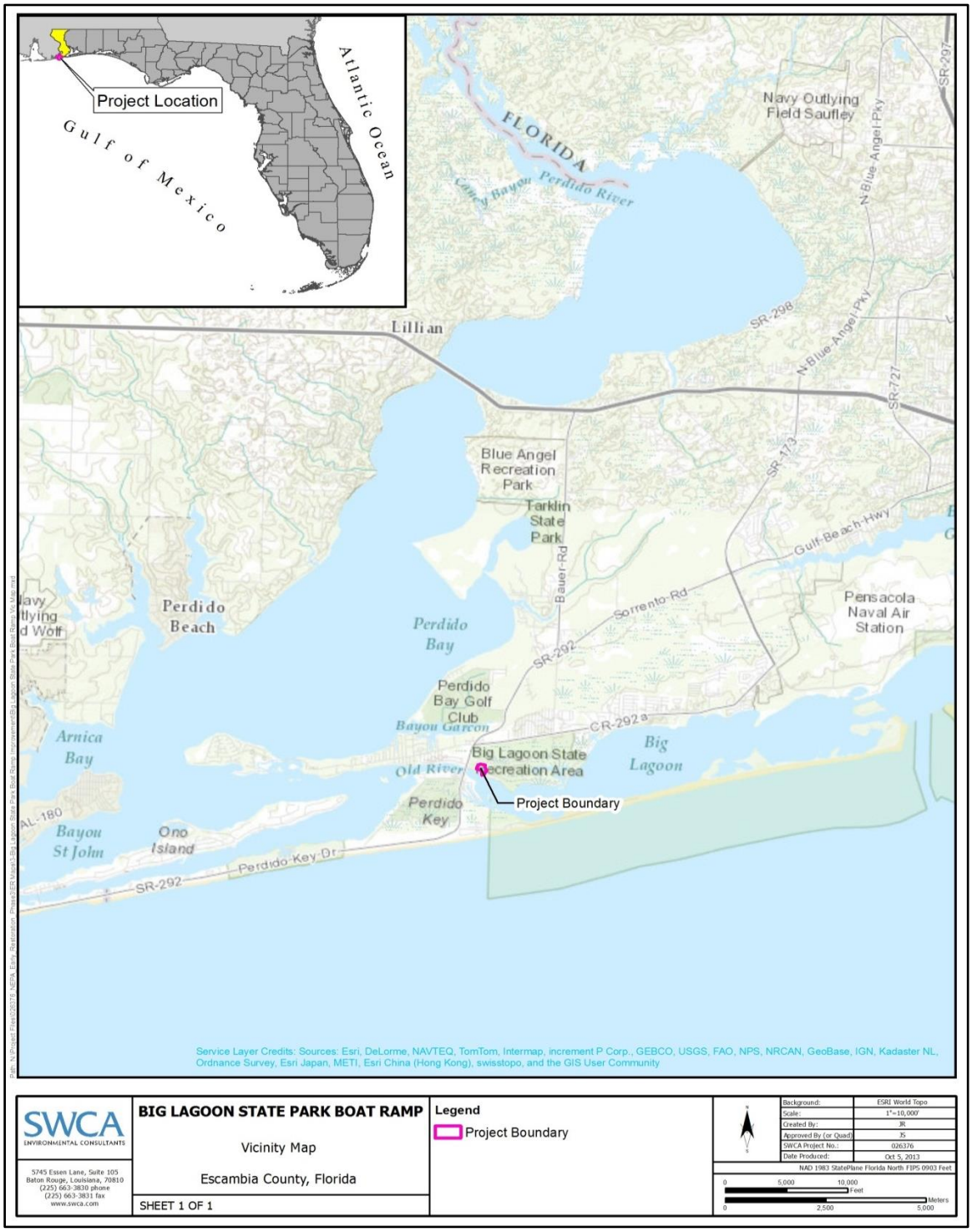


Figure 12-26. Vicinity map of Big Lagoon State Park and the project boundary.

Figure 12-27. Aerial imagery of the project area in Big Lagoon State Park.

12.15.3.2 Construction Methods and Materials

Most of the project would involve upland construction. In addition the existing boat launch ramp would be replaced. Ramp construction would likely require excavation in an area of approximately 500 square meters, of which only a small portion would be in the subtidal area. In general, the construction of a boat ramp can be summarized in terms of executing a number of specific tasks and subtasks including:

Task 1. Site Preparation

a. Prior to beginning any waterward work at the boat ramp site the project area needs to be surveyed and marked. Turbidity curtains are then installed to encapsulate the work area and other erosion control methods are put in place on the landward side of the project (e.g., placement of hay bales) to prevent erosion into the water from equipment movement and any work being performed on the upland areas.

Task 2. Ramp Construction

a. The area for the ramp is surveyed in and marked by stake or pole (typically small diameter 2” or less PVC).
b. A coffer or bladder dam is installed and the water within the dam, between the waterward extent of the ramp and the land, is pumped out to upland storage ponds or run through a filter

system to remove any sediment in the water before returning it to the receiving waterbody. The work area is kept dry by use of dewater pumps (ground water to be pumped is first sampled and tested for water quality) and disposed of in the same manner as the pumped surface water. This dewatering operation is run continuously throughout the construction of the ramps. Once the ramps are completed the dewatering pumps are shut down and the dams are removed.

c. Construction of the ramps begins once the area is sufficiently dry to remove unsuitable soils, if necessary, and replaced with suitable soil. This soil is then compacted to specification. Then the base material for the ramp is placed, usually a rock material. After placement and compaction of the base the ramp is formed, reinforcing steel placed and then the concrete poured and finished. Once curing of the concrete is complete the forms are removed and the coffer or bladder dams are removed.

Task 3. Monitoring

a. Every day, before the start of construction activities, the turbidity screen is checked and repaired if necessary.
b. The foreman or other designated individual checks the area inside the screen and the screen itself to see if any protected species (manatees, dolphins, small tooth sawfish etc) have gotten trapped within the work area or in the screen. If so then appropriate (FWC) personnel are notified to request removal. No work is begun until the animal, fish or bird is removed.
c. During the work day the work area and area adjacent to the work are is monitored to make sure protected species have not ventured into the area. If so then work is stopped until the animal moves out of the area.
d. At the end of the day the area is checked for debris, sediment and possible spillage and these are properly removed and disposed of before shutting down the site.
e. If a storm is anticipated that might damage the turbidity screen it is removed and stored until the storm event has passed and seas have resided.

All in water work would occur within the bladder/coffer dam work area. For the boat ramp this excavated area would be approximately 100 square meters.

A mix of heavy equipment and specific equipment for various activities would be required (e.g., backhoe/excavator, paving equipment, and compacting equipment).

Construction-related materials such as sand, gravel, and concrete forms may be emplaced on the surface of the site. These materials would be staged on existing paved areas to avoid additional surface disturbance.

Assumed equipment usage and worker needs are detailed in Table 12-26.

Table 12-26. Assumed equipment usage and worker needs.

EQUIPMENT	NUMBER OF DAYS USED	NUMBER OF WORKER DAYS	ASSUMPTION
Small barge w/ crane	160	160	1 month use
Tractor-trailer	27	27	1 trip per week for 6 months; plus 3 extra trips for ramp materials delivery
Dump truck	10	10	1 week excavation; 1 week paving
Pickup truck	396	396	Three pickups per day for 6 months
Concrete truck	5	5	1 week use
Bobcat	10	10	1 week excavation; 1 week paving
Grader	5	5	1 week grading
Paving machine	5	5	1 week paving
Roller	5	5	1 week paving
Trackhoe	5	5	1 week excavation
Dozer	10	10	1 week excavation, 1 week grading
Forklift	24	24	One delivery per week for 6 months

Note: Although the project may take up to 1 year to complete, this table assumes 6 months of active construction.

Sixteen small power tools (nail guns, saws, drills) would also likely be used, along with one or two generators as power sources.

During all in-water construction activity the conditions and guidelines of the *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NOAA, 2006) and the *Standard Manatee Conditions for In-Water Work* (USFWS, 2011) would be implemented and adhered to.

12.15.3.3 Best Management Practices

The following construction BMPs would be followed:

- All construction would be performed in accordance with all local, state, and federal requirements as well as all permit requirements to protect the surrounding vegetation and natural condition.
- The contractor would submit a plan for control of surface water runoff in accordance with all local, state, and federal requirements as well as all permit requirements to protect the surrounding vegetation and natural condition.
- All construction adjacent to open water would be separated and confined by appropriate siltation screens and turbidity barriers to protect the quality of such open water.
- Upon completion of construction, the site would be cleared of all construction materials and restored to its natural state, as shown on the plan drawings.
- The contractor would be responsible for assuring compliance with all permit requirements.

In addition to construction BMPs, the contractor would implement BMPs for adequate erosion control. Erosion control is necessary to prevent damage to adjacent property, natural features, site property, and work in progress. Erosion control measures would be in place prior to any land alteration and would be used throughout the construction process until soils are stabilized. Erosion control BMPs are as follows:

1. To protect against wind and stormwater-runoff erosion, the contactor would place, as appropriate, hay bales and silt fencing with wire fence reinforcement, with sediment to be removed when it reaches approximately one-half of the height of the barrier.

2. Silt fences would be of optimal design and materials for adequate sediment control.
3. Side slopes created during construction would be stabilized at the earliest possible date to avoid erosion with adequate use of compacted soil and staked hay bales.
4. Any disturbed area that would not be paved, sodded, or built upon would have a minimum vegetative cover of 80% and be mature enough to control soil erosion and survive severe weather conditions prior to final inspection.
5. Sod would be sufficiently grown and maintained to secure a dense stand of live grass.

12.15.3.4 Construction Permits and Schedule

The project would require a county building permit from Escambia County; a wetlands permit from the U.S. Army Corps of Engineers (USACE) in consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS); a dock and boat ramp permit; an environmental resource permit and sanitary sewer collection system permit from the Florida Department of Environmental Protection (FDEP); and authorization from the Emerald Coast Utilities Authority (ECUA) for a connection permit.

Construction could occur at any time but would ideally take place during the time of year when recreation use is lowest to minimize impacts to boat ramp users. Construction work is expected to take up to 1 year to complete. As of now, completion of the design and permitting is expected to occur through fall and winter 2013. Bidding would take place in spring 2014, and construction would begin in summer 2014.

12.15.4 Operations and Maintenance

As part of the project cost, performance monitoring would be conducted to ensure project plans and designs are correctly implemented.

Park staff would operate, monitor, and maintain the new and expanded facilities under the existing management plan. Maintenance would include tasks such as checking and cleaning restrooms, removing debris and trash from the boat ramp and boat trailer parking areas, and maintaining the parking area over time. Monitoring would include construction monitoring and tracking visitor use.

In addition, the State of Florida Trustees and the Department of the Interior recognize the need to evaluate the effectiveness of conservation measures designed to avoid or minimize impacts to sensitive species or their habitats. To assess the public's awareness of the educational signage intended to minimize impacts of use associated with the improved facilities, readers will be invited to take an online survey accessed via a QR code on the sign. The Florida Trustees and DOI will determine the adequacy of this method of assessing public awareness six months after the completion of construction. If the online surveying is insufficient, concurrent with the twice annual performance monitoring, and performed by the same party, a survey will be taken of a sample of recreational users at the project location.

12.15.5 Affected Environment and Environmental Consequences

12.15.5.1 No Action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

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

12.15.5.2 Physical Environment

12.15.5.2.1 Geology and Substrates

Affected Resources

According to the Geologic Map of Florida, the Park is likely located on the Quaternary system, Pleistocene/Holocene series, Undifferentiated Quaternary Sediments stratigraphic unit. This stratigraphic unit consists of siliciclastics, organics, and freshwater carbonates (Scott et al. 2001). The siliciclastics are light gray, tan, brown to black, unconsolidated to poorly consolidated, clean to clayey, silty, unfossiliferous, variably organic-bearing sands to blue green to olive green, poorly to moderately consolidated, sandy, silty clays. Gravel is occasionally present. Organics occur as plant debris, roots, disseminated organic matrix, and beds of peat. Freshwater carbonates, or marls, are buff-colored to tan, unconsolidated to poorly consolidated, fossiliferous carbonate muds. Sand, silt, and clay may be present in limited quantities, and these carbonates often contain organics. The dominant fossils in the freshwater carbonates are mollusks. Undifferentiated Quaternary Sediments were subdivided during the geologic mapping process according to where they occur. The Park is located on Undifferentiated Quaternary Sediments showing surficial expression in beach ridges and dunes, which primarily consist of sand (Scott 2001).

The Park area lies within the geographical division known as the West Florida Coast Strip, which extends from the mouth of the Ochlockonee River west to Mississippi. This geographic region is characterized by coastal islands and narrow peninsulas. Notable geographic features include the long barrier peninsulas of Santa Rosa Island and Perdido Key (Florida Division of Recreation and Parks 2006).

Topographically, the Park lies in the Coastal Lowlands physiographic region that extends along Florida's entire Gulf coastline. In recent geologic times, the Coastal Lowlands were marine terraces (sea floors) during at least three successive high-ocean-level periods. The area is a flat region, except where remnant dune ridges occur or where the surface has been modified by erosion or underground solution cavities. The Park topography has been slightly modified by roads, parking lots, and recreational facilities (Florida Division of Recreation and Parks 2006).

General soil map units show broad areas that have a distinctive pattern of soils. In the Park, there are likely two general soil map units, both of which are on coastal lowlands. The Lakeland-Hurricane unit is defined as nearly level to moderately sloping, excessively drained, and somewhat poorly drained soils that are sandy throughout. It consists of soils on broad, low ridges; slopes range from 0% to 8%. The Corolla-Newhan-Duckston unit is nearly level to rolling, somewhat poorly drained, excessively drained, and poorly drained soils that are sandy throughout. It consists of soils on dunes, on flats, and in depressions and swales between dunes. It is adjacent to the coast, and slopes are mostly less than 8% (NRCS 2004).

Five distinct soil types occur in the Park: Lakewood Sand, Leon Sand, Coastal Dune Land and Beach, Tidal Marsh, and Freshwater Swamp (Carlisle). Almost all the Park's recreational facilities have been developed on the Coastal Dune Land and Beach soil type (Florida Division of Recreation and Parks 2006).

Environmental Consequences

Mechanized equipment and hand tools would be used to complete construction of the restroom facility, the boat ramp lane, and expansion of the boat trailer parking. Some excavation of soils would occur; however, adverse impacts to geology and substrates would be minor. Soil, rock, and vegetation may be removed from the area where facilities would be built. Long-term, permanent disturbance would occur where the boat ramp and boat trailer parking is expanded and on the footprint of the restroom. The possible construction of sidewalks and landscaped beds would also be long-term permanent disturbance. Temporary short-term disturbance may occur in other portions of the project area.

Disturbance to geologic features or soils would be detectable, but would be short term, small, and localized. There would be no long-term changes to local geologic features or soil characteristics. Erosion and/or compaction may occur in localized areas, but would be minimized by the erosion-control BMPs specified above.

12.15.5.2.2 Hydrology and Water Quality

Affected Resources

Northwest Florida has seven major watersheds, all of which have been identified as priorities under the Surface Water Management and Improvement (SWIM) program. Water quality protection is the underlying goal of SWIM, along with the preservation and restoration of natural systems and associated public uses and benefits (Northwest Florida Water Management District [NWFWMD] 2011). Big Lagoon is part of the Pensacola Bay watershed system, which includes Pensacola, Escambia, Blackwater, and East bays, the western portion of Santa Rosa Sound, and numerous rivers and bayous. The waterways are primarily used for transportation, seafood harvesting, recreation, and waste disposal. The total drainage area covers nearly 7,000 square miles, approximately 34% of which is in Florida. The entire system discharges into the Gulf of Mexico, primarily through a narrow pass at the mouth of Pensacola Bay (NWFWMD 2013). Broad issues for the Pensacola Bay system include water and sediment quality degradation through point and nonpoint pollution sources, habitat quality that is threatened by and degraded through sedimentation and deposition, management and coordination between two states and numerous local governments and agencies, and public education and awareness (Thorpe 1997).

Big Lagoon has been classified as an Outstanding Florida Water (OFW) by the State of Florida (Florida Administrative Code 62-302.700). An OFW is water designated worthy of special protection because of its natural attributes (e.g., excellent water quality or exceptional ecological, social, educational, or recreational value). OFWs are protected through more stringent requirements for activities requiring a permit from the FDEP or a water management district. Waters are designated OFW to prevent the lowering of existing water quality and to preserve the exceptional features of the waterbody. Surface waters are also classified as Class III waters by the FDEP (Florida Division of Recreation and Parks 2006). Class III waters have the designated uses of fish consumption, recreation, and propagation and maintenance of a healthy, well-balanced population of fish and wildlife.

Impaired waters are waters that are too polluted or otherwise degraded to meet the water quality standards set by states, territories, or authorized tribes. Big Lagoon has been listed as an impaired waterbody for mercury in fish tissue, and the Park itself has been listed as an impaired waterbody for fish and wildlife propagation; however, total maximum daily loads (TMDLs) have not yet been adopted for either location (Environmental Protection Agency [EPA] 2010).

The typical hydrogeological sequence in the Park region consists of predominantly sandy materials in the uppermost deposits. Underlying these upper sandy deposit are variably thick layers of clayey materials that function as confining beds. Beneath this zone is the Floridian Aquifer, composed of several limestone formations. No known groundwater wells exist in the Park (Florida Division of Recreation and Parks 2006).

Several large ditches occur in the Park with origins or outflows extending beyond Park boundaries.

Wetlands

Big Lagoon is designated as an estuarine and marine deep water wetland. The Park contains the following wetlands: freshwater forested and shrub, freshwater emergent wetland, estuarine and marine deep water, estuarine and marine wetland, and freshwater pond (USFWS 2013). Based on the National Wetland Inventory data, the on-land portion of the project in the Park does not appear to overlap any wetlands; however, the in-water portion of the project would take place within Big Lagoon, a designated wetland.

Floodplains

Based on Federal Emergency Management Agency (FEMA) flood insurance rate maps (Panel 12033C0508G and 12033C0516G), the project appears to be primarily in Zone X, with the coastal area located in Zone AE. Zone X is defined as other flood areas, consisting of areas with a 0.2% chance of flood, or a 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, or areas protected by levees from a 1% annual chance flood. Zone AE has defined base flood elevations and is an area of special flood hazard (FEMA 2006).

Environmental Consequences

Hydrology would likely be affected only if water is channeled or otherwise controlled around the boat ramp area during construction. Water quality would be impacted during construction by leaks or spills from equipment and disturbance of sediments that affect siltation, turbidity, and the release of chemicals from sediments. If the disturbed sediments are anoxic, the biological oxygen demand in the water column would increase. Erosion from the banks of Big Lagoon would also affect water quality. With required mitigation in place, the effect on hydrology and water quality would be measurable or detectable but small, short term, and localized. Upon project completion, water quality impacts would quickly become undetectable; the area's hydrology would be only temporarily altered during construction.

The proposed discharge of dredged or fill material into waters of the United States, including wetlands, or work affecting navigable waters associated with this project is currently being coordinated with the U.S. Army Corps of Engineers (Corps) pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). Coordination with the Corps and final authorization pursuant to CWA/RHA will be completed prior to project implementation.

All permit conditions, including mitigation measures for siltation, erosion, turbidity, and release of chemicals, would be strictly followed. 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 sedimentation impacts, as well as the damage and loss of wildlife habitats. FDEP permit conditions require erosion and turbidity mitigation measures, which include the following:

- Installation of floating turbidity barriers.
- Installation of erosion control measures along the perimeter of all work areas.
- Stabilization of all filled areas with sod, mats, barriers, or a combination.
- Stoppage of work if turbidity thresholds are exceeded. The soils would then be stabilized, work procedures modified, and the FDEP would be notified.

The FDEP permit also constitutes a Certification of Compliance with State Water Quality Standards under Section 401 of the CWA, which indicates that the project would comply with state water quality standards and other aquatic resource protection requirements.

After construction, increased boat traffic in Big Lagoon could result in minimal impacts to surface water quality. Boat wakes created by additional boat traffic that could increase shoreline erosion would be controlled through no-wake or speed zones to mitigate shoreline erosion on the lagoon.

Impacts from chemicals that could be released from sources such as construction equipment and boats would likely be negligible. Required spill containment measures would be implemented for applicable construction activities. FDEP permit conditions require spill containment protection and mitigation measures as follows:

- Prohibiting boat repair or fueling facilities over the water
- Prohibiting vessels from being removed from the water for maintenance or repair
- Prohibiting activities such as hull cleaning and painting; discharge or release of oils or greases; and related metal-based bottom paints associated with hull scraping, cleaning, and painting (Consolidated Wetland Resource Field Permit and Sovereign Submerged Lands Authorization, FDEP, July 12, 2010).

The project would not be expected to impact groundwater.

Wetlands
A wetlands permit would be required for the project and would stipulate appropriate BMPs and mitigation. Because all permit conditions would be strictly adhered to, the effect on wetlands would be minor and short term, and wetland function would be remain unimpaired or would be replaced through required mitigation.

Floodplains
No appreciable increased risk of flood loss, including impacts to human safety, health, and welfare, is expected to occur because the project would not impact vegetation, slopes, or coastal conditions in a substantial manner.

12.15.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources
The Clean Air Act (CAA) requires that the Environmental Protection Agency (EPA) set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. NAAQS have been set for six common air pollutants (also known as criteria pollutants), consisting of particle pollution or particulate matter, ozone, carbon monoxide, sulfur dioxide (SO_2), nitrogen dioxide, and lead. Particulate matter is defined as fine particulates with a diameter of 10 micrometers or less

(PM_{10}), and fine particulates with a diameter of 2.5 micrometers or less ($PM_{2.5}$). When a designated air quality area or airshed in a state exceeds the NAAQS, that area may be designated as a "nonattainment" area. Areas with levels of pollutants below the health-based standard are designated as "attainment" areas. To determine whether an area meets the NAAQS, air monitoring networks have been established and are used to measure ambient air quality. The EPA also regulates 187 hazardous air pollutants (HAPs) that are known or suspected to cause cancer or other serious health impacts.

Air quality in the Florida panhandle is in attainment with the NAAQS (EPA 2013a). The Northwest District Air Program (NDEP) operates two air monitors in Escambia County. The Ellyson Industrial Park monitor in Ferry Pass records ozone, $PM_{2.5}$, and SO_2 concentrations. The Naval Air Station monitor records ozone concentrations. Readings at both monitors for the last 3 years show attainment with the NAAQS for ozone and SO_2 (FDEP 2013c). $PM_{2.5}$ attainment data were not available (EPA 2013c).

Greenhouse Gases

Gases that trap heat in the air are called greenhouse gases (GHGs). The primary GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_x), and fluorinated gases. Over the past century, human activities have released large amounts of GHGs into the atmosphere, which are contributing to global warming. Global warming is defined as the ongoing rise in global average temperature near the Earth's surface, and is known to cause changes in climate patterns.

According to the EPA, the average annual temperature in the southeast portion of the United States has increased by approximately 2.0 degree Fahrenheit (°F) since 1970. Winters, in particular, are getting warmer, and the average number of freezing days has decreased by 4–7 days per year since the mid-1970s. Most areas are getting wetter; autumn precipitation has increased by 30% since 1901 (EPA 2013b). In many parts of the region, the number of heavy downpours has increased. Despite the increases in fall precipitation, the area affected by moderate and severe drought has increased since the mid-1970s (EPA 2013b).

Average annual temperatures in the region are projected to increase from 4°F to 9°F by 2080. Hurricane-related rainfall is projected to continue to increase. Models suggest that rainfall would arrive in heavier downpours, with increased dry periods between storms. These changes would increase the risk of both flooding and drought. The coasts would likely experience stronger hurricanes and sea level rise. Storm surge could present problems for coastal communities and ecosystems (EPA 2013b).

Total GHG emissions in Florida from 1990 to 2007 have increased at an average rate of 2.1% per year. Total GHG emissions in 2007 were 290 million metric tons of CO_2 equivalent ($MMTCO_2E$). In 2007, 91% of GHG emissions in Florida were CO_2 emissions (FDEP 2010).

Environmental Consequences

Project implementation would require the use of heavy mechanized equipment, which would lead to temporary emissions (e.g., criteria pollutants, HAPs, GHGs) from the operation of construction vehicles and equipment. Any air quality impacts that occurred would be measurable but minor due to their localized nature and short-term duration as well as the small size of the project. BMPs would be employed to prevent, mitigate, and control potential air pollutants during project implementation, such as following speed limits and prohibiting idling unless necessary to run equipment. No air quality-related permits would be required because of the minimal levels of emissions.

Greenhouse Gases

The major types of construction equipment that would contribute to GHG emissions for this project are listed in Table 12-27, along with their estimated GHG emissions. GHG emissions from the remaining (hand) equipment would be negligible. The emissions estimates are based on the operating assumptions in Table 12-27.

Based on the assumptions detailed in Table 12-27, the project would generate approximately 429 metric tons of GHGs over the duration of all phases. The following mitigation measures have been identified to reduce or eliminate GHG emissions from the project:

- Shut down idling construction equipment, if feasible.
- Locate staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites.
- Encourage the use of the proper equipment size for the job to maximize energy efficiency.
- Encourage the use of alternative fuels for generators at construction sites, such as propane or solar, or use electrical power where practicable.

The project would have short-term minor impacts but no long-term impacts on GHG emissions. Mitigation measures would minimize GHG emissions.

Table 12-27. Greenhouse gas impacts of the proposed project from major construction equipment.

EQUIPMENT DESCRIPTION	TOTAL HOURS USED	CO_2 FACTOR-MT/100HRS*	CO_2 (MT)	CH_4 FACTOR-MT/100HRS	CH_4 (MT)	NO_2 FACTOR-MT/100HRS	NO_2 (MT)	TOTAL CO_2 (MT)
Dump trucks / flatbed trucks	296	1.7	5.0	0.5	1.5	7.2	21.3	27.8
Pickup trucks	3,168	1.1	34.8	0.35	11.1	4.4	139.4	185.3
Concrete trucks	40	1.7	0.7	0.5	0.2	7.2	2.88	3.76
Bobcat (bare and w/auger mount)	80	2.65	2.1	0.9	0.7	10.6	8.5	11.3
Moto grader	40	2.25	0.9	0.65	0.3	1.08	0.4	1.6
Paving machine	40	2	0.8	0.5	0.2	8	3.2	4.2
Rollers	40	2	0.8	0.5	0.2	8	3.2	4.2
Trackhoe (w/ bucket/ thumb or vibratory attachments)	40	2.55	1.0	0.85	0.3	10.2	4.1	5.4
Dozer	80	2.25	1.8	0.65	0.5	1.08	0.9	3.2
Forklift	192	2.25	4.3	0.65	1.2	1.08	2.1	7.6
Crane (bare and w/clamshell attachment)	1,280	2.55	32.6	0.85	10.9	10.2	130.6	174.1
Total	**5,296**							**428**
*mt = metric tons								

At project completion, visitor use (and therefore vehicle and boat use) could increase due to the improved access. Increased exhaust emissions could affect air quality over the long term. However, adverse impacts to air quality are expected to be minor because management actions could be taken if necessary to limit Park visits and boat use, and because these would be negligible in the context of the total miles traveled in the regional airshed.

12.15.5.2.4 Noise

Affected Resources

Noise can be defined as unwanted or nuisance sound. The Noise Control Act of 1972 (42 United States Code [USC] 4901–4918) was enacted to establish noise control standards and to regulate noise emissions from commercial products such as transportation and construction equipment. Amplitude is the magnitude of a sound and is usually expressed in decibels (dB), a dimensionless ratio of sound pressure to that of a reference pressure. The A-weighted decibel (dBA) is the adjusted unit of sound used to describe the human response to noise from industrial and transportation sources. The threshold of hearing is 0 dBA. A 3-dBA increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear.

Table 12-28 shows typical noise levels for common sources expressed in dBA. Noise exposure depends on how much time an individual spends in different locations.

Table 12-28. Typical noise levels for common sources.

NOISE SOURCE OR EFFECT	SOUND LEVEL (DBA)
Rock-and-roll band	110
Truck at 50 feet	80
Gas lawnmower at 100 feet	70
Normal conversation indoors	60
Moderate rainfall on foliage	50
Refrigerator	40
Bedroom at night	25

Source: Adapted from U.S. Department of Energy (1986).

Noise levels in the project area vary depending on the season, time of day, number and types of noise sources, and the distance of the receptor from noise sources. Existing sources of noise in the project area are from recreational boating, traffic on nearby roads and highways, overhead aircraft, nearby residential activities (such as lawn care), and ambient natural sounds such as wind, waves, and wildlife.

Noise-sensitive receptors include sensitive land uses as well as individuals and/or wildlife that could be affected by changes in noise sources or levels due to the project. Noise-sensitive receptors in the project area include recreational users, nearby residences, and wildlife. No residential properties are directly adjacent to the boat ramp location.

Environmental Consequences

Instances of increased noise would occur during the project. Equipment, tools, and vehicles used during the construction of the restroom facility, addition of the boat ramp lane, and expansion of the boat trailer parking would generate noise. Construction equipment noise is known to disturb fish, marine mammals, and nesting shorebirds. Construction noise would also negatively affect the experience of Park visitors in areas near project construction activities. The noise would be temporary and the construction period is not anticipated to last more than 12 months. Because of the temporary nature of the construction noise, negative impacts to the soundscape would be short term and of a level that is likely to attract visitor attention but not cause any changes in visitor or resident activities.

After project completion, the soundscape would return to pre-project levels. The potential for increased vehicle and boat traffic exists due to the improved access to Big Lagoon, which would result in a slight increase in noise levels in the vicinity. Overall, long-term noise impacts from boating and other recreational activities would remain minor.

12.15.5.3 Biological Environment

12.15.5.3.1 Living Coastal and Marine Resources

Vegetation

Affected Resources

A variety of plant communities occur in the Park, from tidal salt marshes to pine flatwoods. Sandpine scrub is present on sandy relic dunes, and slash pines grow throughout the dune "swales," as well as in wet or water-logged soils among impenetrable thickets (FSP 2010).

The Park contains nine distinct natural communities, in addition to ruderal and developed areas. These communities are mesic flatwoods (23.3 acres), scrub (107.8 acres), scrubby flatwoods (273.6 acres), basin swamp (41.3 acres), baygall (99.0 acres), wet flatwoods (84.3 acres), estuarine seagrass bed (0.7 acre), estuarine tidal marsh (47.6 acres), and estuarine unconsolidated substrate (4.7 acres). Ruderal areas comprise 14.1 acres of the Park; developed areas comprise 36.1 acres. The project area is located partly within ruderal and previously developed areas; undeveloped portions of the project area consist of scrubby flatwoods (Florida Division of Recreation and Parks 2006). A list of state designated threatened, endangered, candidate, and other plant species of concern likely to occur in Escambia County and the Park can be found in Table 12-29.

Although Godfrey's golden aster (*Chrysopsis godfreyi*) was not reported as likely to occur in Escambia County, it has been observed in the Park as a relatively small population along the ridgeline near the East Beach use area. According to Florida Natural Areas Inventory (FNAI) rankings, it is imperiled in Florida due to rarity or vulnerability to extinction from some natural or manmade factor. (The FNAI maintains a comprehensive database of the biological resources of Florida.) This plant is endemic to barrier islands and spits from Franklin County to Escambia County, and typically blooms in late October–November (Florida Division of Recreation and Parks 2006).

Table 12-29. State protected threatened, endangered, candidate, and other plant species of concern likely to occur in Big Lagoon StatePark.

RESOURCE CATEGORY	COMMON NAME	SCIENTIFIC NAME	USFWS STATUS	STATE STATUS	NATURAL COMMUNITIES
Plants	Curtiss' sandgrass	*Calamovilfa curtissii*	--	T	Palustrine: mesic and wet flatwoods, wet prairie, depression marsh Terrestrial: mesic flatwoods **Observed in the Park.**
Plant	Godfrey's golden aster	*Chrysopsis godfreyi*	--		Terrestrial: Grassland/herbaceous, Sand/dune, Shrubland/chaparral **Observed in the Park.**
Plants	Large-leaved jointweed	*Polygonella macrophylla*	--	T	Terrestrial: scrub, sand pine/oak scrub ridges **Major concentrations occur in the Park in the large ruderal area west of the boat ramp, in scrub north of the campground, and throughout the northern strip of scrub along the Gulf Beach Highway.**
Plants	Red-flowered or sweet pitcher plant	*Sarracenia rubra*	–	T	Palustrine: bog, wet prairie, seepage slope, wet flatwoods Riverine: seepage stream banks **Believed to be extirpated in the Park.**
Plants	White-top pitcher plant	*Sarracenia leucophylla*	--	E	Palustrine: wet prairie, seepage slope, baygall edges, ditches **Believed to be extirpated in the Park.**

E = endangered; T = threatened; USFWS = U.S. Fish and Wildlife Service
Source: USFWS Panama City Ecological Services/Fish and Wildlife Conservation Office (2013) and Florida Division of Recreation and Parks (2006).

* All plants listed on the Florida Endangered Plant List, the Threatened Plant List, and the Commercially Exploited Plant List as set forth herein are referred to as regulated. Information concerning scientific name, references, common names, family, and descriptions for these listed plants is available in the Florida Department of Agriculture and Consumer Services, Division of Plant Industry's "Notes on Florida's Endangered and Threatened Plants," (Bureau of Entomology, Nematology and Plant Pathology – Botany Section, Contribution No. 38, 3rd edition – 2000). A copy of the publication is free to Florida residents and may be obtained by writing to the Florida Department of Agriculture and Consumer Services, Division of Plant Industry, P. O. Box 147100, Gainesville, Florida 32614-7100.

The Park provides extensive habitat for the large-leaved joint weed, which has segmented stems and tiny white flowers that bloom in the early fall. These plants grow in the semi-arid sands of scrub-like habitats, and require relative openings in canopy cover. The total number of plant species in the Park is estimated at 500–1,000 (Florida Division of Recreation and Parks 2006).

The two species of pitcher plants listed in Table 12-29 occurred in the Park as recently as the early 1980s. Small colonies of both were reported in a low shrub-dominated wetland in the western portion of the Park. A small colony of white-top pitcher plant was also recorded in the open wet flatwoods just south of the campground. No pitcher plants were found during field surveys in 2001; both species are believed to be extirpated from the Park (Florida Division of Recreation and Parks 2006).

In 2003, 543 acres of seagrass beds were identified in Big Lagoon through mapping from aerial photography. No seagrass beds were identified near the boat ramp area of the Park. Turtle grass (*Thalassia testudinum*) was the most common species in eastern Big Lagoon, followed by shoal grass

(*Halodule wrightii*). Both species were identified during a limited 2010 sampling effort. Currently, acreage of seagrass beds in Big Lagoon is probably stable (Yarbro, L.A. and P.R. Carlson 2011).

Environmental Consequences

Construction of the facilities would require the permanent removal of vegetation within the affected areas. The long-term, permanent surface disturbance would occur on ruderal and previously developed areas that may lack vegetation, but could also impact areas of scrubby flatwoods. Expansion of the boat ramp could impact in-water vegetation through permanent removal or short-term disturbance.

In areas of short-term surface disturbance, infrequent and minimal disturbance to individual plants would be expected, and local or range-wide population stability would not be affected. One-time disturbance to locally suitable habitat could occur, but sufficient habitat would remain functional at the local and regional scales to maintain the viability of the species. Where new structures and facilities are placed, the loss of vegetation would be limited to the project footprint but would persist for the life of the facilities (i.e., indefinitely).

The use of equipment and disturbance of soil and existing vegetation would also create a risk of noxious weed or invasive vegetative species introduction. Those undeveloped areas disturbed during construction would be monitored, and exotic species removed. The opportunity for the increased spread of non-native species would be temporary and localized, and would not be anticipated to displace native species populations and distributions.

Due to the prevalence of both weeds and rare plants in the Park, preconstruction vegetation surveys and preconstruction and postconstruction weed treatments would likely be required. The presence of any special status species would be considered during the design phase of the project, and precautions would be taken to avoid them.

Improvements to the Park would likely attract additional visitors. Increased human presence could have a long-term minor effect on vegetation in the Park because of the greater likelihood of trampling, picking, or other vegetative disturbance. This type of impact would probably occur in areas closest to Park facilities.

12.15.5.4 Wildlife Habitat

Affected Resources

A variety of wildlife can be found in the Park, including reptiles (specifiacally the diamondback terrapin (*Malaclemys terrapin*); and Gulf salt marsh snake (*Nerodia clarkii clarkii*), and other general snakes, turtles, and lizards, including skinks); amphibians (frogs and toads); at least seven butterfly species; beavers (*Castor canadensis*), opossums (*Didelphis virginiana*); striped skunks (*Mephitis mephitis*); white-tailed deer (*Odocoileus virginianus*); raccoons (*Procyon lotor*); gray squirrels (*Sciurus carolinensis*); gray foxes (*Urocyon cinereoargenteus*); marsh rabbits (*Sylvilagus palustris*); and big brown bats (*Eptesicus fuscus*). The Park also hosts a wide variety of resident and migratory birds, especially during spring and fall migrations (Florida Division of Recreation and Parks 2006).

Environmental Consequences

Although common wildlife may be disturbed by the noise and activity of construction, the disturbance would be of a temporary and short-term nature (less than 6 months). Additional habitat is present in the Park, which would allow for the movement and dispersal of individual animals away from the

construction area during this time. Permanent habitat loss would occur where new facilities are developed.

12.15.5.5 Marine and Estuarine Fauna

Affected Resources

Big Lagoon provides habitat for numerous turtles, fishes, and other marine species. Redfish (*Sciaenops ocellatus*), bluefish (*Pomatomus slatatrix*), flounder (*Paralichthys* spp.), sea trout (*Cynoscion nebulosus*), striped mullet (*Mugil cephalus*), and crabs are regularly caught in Big Lagoon (FDEP 2013a). Benthic organisms (including bivalves, gastropods and other mollusks), annelids, and crustaceans may also be present in the waters off the Park.

Environmental Consequences

Construction activities would be expected to have a minor, short-term impact on fish because of the small project footprint, the short (up to 1 year) temporal timescale, and adherence to the BMPs listed above. Over the long term, increases in boating and other recreational uses may occur due to the improved access and facilities at the sites. These recreational activities are generally low-impact for fish and would be expected to have a negligible impact on fish populations.

12.15.5.6 Protected Species

Affected Resources

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

The Trusteeshave reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS. For this, the Trusteesfirst reviewed the species list for Escambia County, Florida[16]. Table 12-30 presents a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

[16] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

Table 12-30. Potential Impacts to Species/Critical Habitats managed by USFWS

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle[a], Hawksbill turtle[a], Kemp's ridley turtle; Leatherback turtle[a], Loggerhead turtle	Any potential impacts to in-water sea turtles will be evaluated by National Marine Fisheries Service as this is the agency that has jurisdiction to review impacts to sea turtles in the estuarine and marine environments. Sea turtle nesting is not expected in the project area because of its shoreside location within the Big Lagoon portion of Pensacola Bay and lack of suitable nesting habitat. Rather the turtles use the beaches directly along the Gulf Coast for nesting. Therefore, no impacts to sea turtles in terrestrial habitats are expected. No proposed or designated critical habitat for sea turtles occurs within the action area; including the limited area of in-water work, therefore, none will be adversely modified or destroyed.
West Indian manatee	Escambia county is not part of the 36 Florida counties that are identified as being counties where manatees regularly occur in coastal and inland waters (U.S. Department of the Interior, 2011). However, manatees could be present in the project waters. The main risk to manatees during implementation and use of this project would come from collisions with any vessel/equipment during construction or visitor use. Because of the conservation measures, the Trusteeshave determined the risk of potential impacts to manatees from the proposed project is insignificant and discountable.
Piping plover	The main risk to Piping plovers during construction is from human disturbance while resting or foraging in habitats adjacent to work areas. The proposed project could result in short term increases in noise which could startle nearby individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the plovers to move to a nearby area. Because other foraging/resting habitats, including critical habitat are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. In addition conservation measures are expected to minimize the risk of disturbance from visitors boating from the ramp to nearby locations, such as Perdido Key, to the piping plover such that impacts are insignificant and discountable. Piping plover critical habitat is not designated in the action area but is approximately 1,600 meters from the action area. If plovers were using the action area during construction, the Trusteeswould expect them to move to the nearby critical habitat which is more suitable for foraging and resting. The primary constituent elements (PCEs) of wintering piping plover critical habitat include: 1) Intertidal flats with sand or mud flats (or both) with no or sparse emergent vegetation. 2) Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers. Such sites may have debris, detritus, or microtopographic relief (less than 50 cm above substrate surface) offering refuge from high winds and cold weather. 3) Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas. 4) Washover areas are broad, unvegetated zones, with little or no topographic relief, that are formed and maintained by the action of hurricanes, storm

SPECIES/CRITICAL	SPECIES/CRITICAL HABITAT IMPACTS
	surge, or other extreme wave action. Project construction will not adversely modify or destroy critical habitat for piping plover because the construction work will not be taking place in any of the habitats listed above nor are temporary construction impacts expected to alter any of the PCE's.
Red knot	As of October 2, 2013, no bird observations (ebird.org) have reported from Big Lagoon State Park; however, red knots have been observed using Gulf Islands National Seashore which is approximately 2,000 meters from Big Lagoon (across the lagoon). The main risk to Red knots is from human disturbance while resting and foraging in habitats adjacent to work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the red knots to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. In addition conservation measures are expected to minimize the risk of disturbance from visitors boating from the ramp to nearby locations, such as Perdido Key, to the red knot such that impacts are insignificant and discountable.
Perdido Key beach mouse Perdido Key beach mouse critical habitat	Neither Perdido Key beach mouse or its critical habitat occurs within Big Lagoon State Park. Rather both occur on Perdido Key across the lagoon from the project site. Primary constituent elements (PCEs) for the Perdido Key beach mouse critical habitat are: 1) A contiguous mosaic of primary, secondary scrub vegetation, and dune structure, with a balanced level of competition and predation and few or no competitive or predaceous nonnative species present, that collectively provide foraging opportunities, cover, and burrow sites; 2) Primary and secondary dunes, generally dominated by sea oats that, despite occasional temporary impacts and reconfiguration from tropical storms and hurricanes, provide abundant food resources, burrow sites, and protection from predators; 3) Scrub dunes, generally dominated by scrub oaks, that provide food resources and burrow sites, and provide elevated refugia during and after intense flooding due to rainfall and/or hurricane induced storm surge; 4) Functional, unobstructed habitat connections that facilitate genetic exchange, dispersal, natural exploratory movements, and recolonization of locally extirpated areas; and 5) A natural light regime within the coastal dune ecosystem, compatible with the nocturnal activity of beach mice, necessary for normal behavior, growth and viability of all life stages. Project construction will not adversely modify or destroy critical habitat for the Perdido Key beach mouse because the construction work will not be taking place in any of the habitats listed above nor are temporary construction impacts expected to alter any of the PCE's.
Gulf sturgeon	NMFS was consulted on Gulf sturgeon and its Critical Habitat in the estuarine environment. As a result, Gulf Sturgeon was not considered in the consultation with the USFWS.

In addition to the protected species managed by USFWS, the Trusteesreviewed the proposed projects and associated actions for potential impacts to the following protected species (status indicated) and their associated critical habitat, if appropriate, managed by NMFS:

- Gulf Sturgeon, *Acipenser oxyrinchus desotoi*, Threatened
- Smalltooth Sawfish, *Pristis pectinata,* Endangered
- Green Sea Turtle, *Chelonia mydas*, Endangered
- Loggerhead Sea Turtle, *Caretta caretta*, Threatened
- Hawksbill Sea Turtle, *Eretmochelys imbricata*, Endangered
- Leatherback Sea Turtle, *Dermochelys coriacea*, Endangered
- Kemp's Ridley Sea Turtle, *Lepidochelys kempii*, Endangered.

Additional information on some of these species is provided below.

Perdido Key Beach Mouse

Big Lagoon State Park is close to Perdido Key, which forms the southern boundary of the lagoon. This area includes the Gulf Islands National Seashore Unit, a part of Perdido Key containing a portion of the only remaining population of the Perdido Key beach mouse. This species was listed as endangered by the USFWS on June 6, 1985 (50 *Federal Register* 23872). Critical habitat for this species, as shown on Figure 12-28, was designated at the time of listing to include primary and secondary dunes characterized by dense stands of mostly sea oats (*Uniola paniculata*) and blue stem (*Schizachyrium scoparium*) (71 *Federal Register* 197). The project area is not in or adjacent to critical habitat. Habitat loss and fragmentation associated with residential and commercial real estate development are the primary threats contributing to the endangered status of beach mice (Holler 1992a; Humphrey 1992). Artificial lighting alters behavior patterns, causing beach mice to avoid otherwise suitable habitat and decreases the amount of time they are active in those areas (Bird et al. 2004).

Marine Mammals

Escambia County is not listed as one of the 36 Florida coastal and inland counties in which manatees (*Trichechus manatus*) regularly occur (USFWS 2011). However, because there are some seagrasses around the project area, manatees are known to migrate through the area, although they are not known to stay for any length of time to forage or rest. Implementation of controls during construction (e.g., the *Standard Manatee Conditions for In-Water Work* (USFWS 2011) along with the installation of the previously described educational signage are expected to minimize impacts to manatees and marine mammals in general.

Gulf Sturgeon

The Gulf sturgeon (also known as the Gulf of Mexico sturgeon) is one of seven species of sturgeon in North America. It inhabits both saltwater and freshwater habitats in the fall/winter and spring/summer, respectively. The Gulf sturgeon is a benthic feeder that eats organisms in or on the bottom of the water, including crabs, grass shrimp, lancets, brachiopods, and marine worms. It typically gorges on food during the fall-to-spring period when in brackish and saltwater habitats; however, it appears to fast from spring to fall when in freshwater habitats. Gulf sturgeon usually return to their home freshwater river or stream to spawn (in the spring). Currently, the main threat to Gulf sturgeon is constituted by dams on

Gulf seaboard rivers that prevent connections to historic spawning areas. Habitat destruction is also a threat, especially because the sturgeon lives in areas at risk of dredging, which destroys eggs and affects food sources. Other threats include lethal by-catch and declining water quality (FWC 2013a).

The Gulf sturgeon was federally listed as threatened on September 30, 1991, after stocks were greatly reduced or extirpated throughout much of their historic range by overfishing, dam construction, and habitat degradation. Critical habitat was designated in 14 geographic areas in Gulf of Mexico rivers and tributaries on March 19, 2003 (NOAA FS 2013).

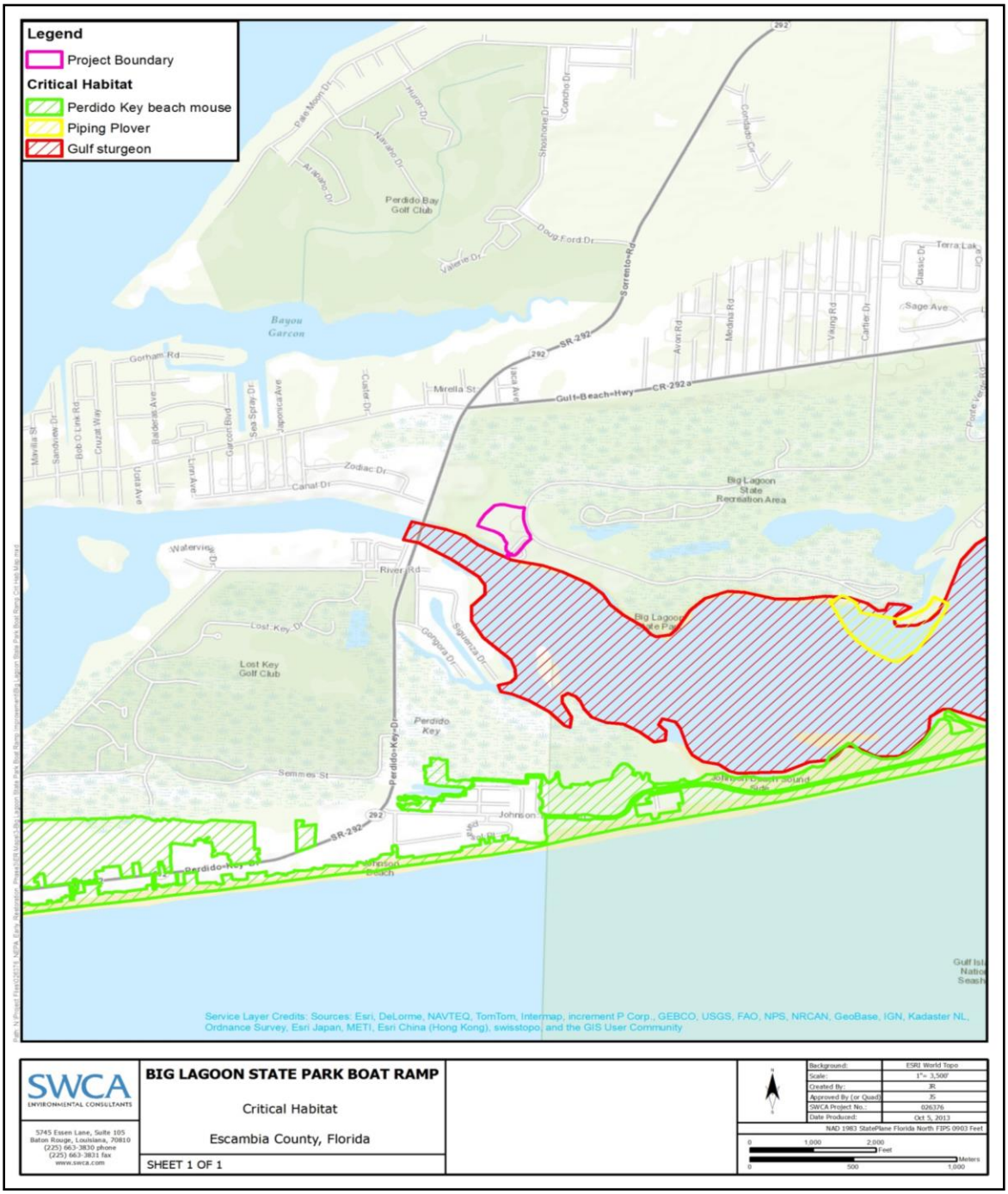
As shown on Figure 12-28, the project is in designated Gulf sturgeon critical habitat (Unit 9). Unit 9 is the Pensacola Bay System in Escambia and Santa Rosa Counties, which includes Big Lagoon. This unit provides winter feeding and migration habitat for Gulf sturgeon from the Escambia and Yellow River subpopulations. Gulf sturgeon collect, or migrate through, during the fall and winter season. Movement is generally along the shoreline area of Pensacola Bay.

Piping Plover

The piping plover, a threatened species, typically inhabits sandy beaches, sandflats, and mudflats along coastal areas for wintering (FWC 2013a). Piping plover habitat is located in and around the East Beach use area. This eastern portion of the Park surrounding the observation tower, including the peninsula and mudflats to either side of the tower, has been designated as critical habitat for the plover (see Figure 12-28) (Florida Division of Recreation and Parks 2006). The project area is not in or adjacent to the critical habitat. Threats to this species include loss of habitat by development on beaches. Human and domestic animal disturbance can also lead to nest abandonment. Other threats include predation by raccoons, skunks, and foxes (FWC 2013a).

Red Knot

The red knot, a federal proposed species, uses the state of Florida both for wintering habitat and migration stopover habitat for those that continue to migrate down to specific wintering locations in South America (Niles et al. 2008). Wintering and migrating red knots forage along sandy beaches, tidal mudflats, saltmarshes, and peat banks (Harrington 2001). Observations indicate that red knots also forage on oyster reef and exposed bay bottoms, and roost on high sand flats, reefs, and other sites protected from high tides (Niles et al. 2008). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Threats to wintering and stopover habitat in Florida include shoreline development, hardening, dredging, deposition, and beach raking (Niles et al. 2008).



SWCA ENVIRONMENTAL CONSULTANTS
5745 Essen Lane, Suite 105
Baton Rouge, Louisiana, 70810
(225) 663-3830 phone
(225) 663-3831 fax
www.swca.com

BIG LAGOON STATE PARK BOAT RAMP

Critical Habitat

Escambia County, Florida

SHEET 1 OF 1

Background:	ESRI World Topo
Scale:	1"= 3,500'
Created By:	JR
Approved By (or Quad):	JS
SWCA Project No.:	026376
Date Produced:	Oct 5, 2013

NAD 1983 StatePlane Florida North FIPS 0903 Feet

0 1,000 2,000 Feet

0 500 1,000 Meters

Figure 12-28. Perdido Key beach mouse, Gulf sturgeon, and piping plover critical habitat in and near Big Lagoon State Park.

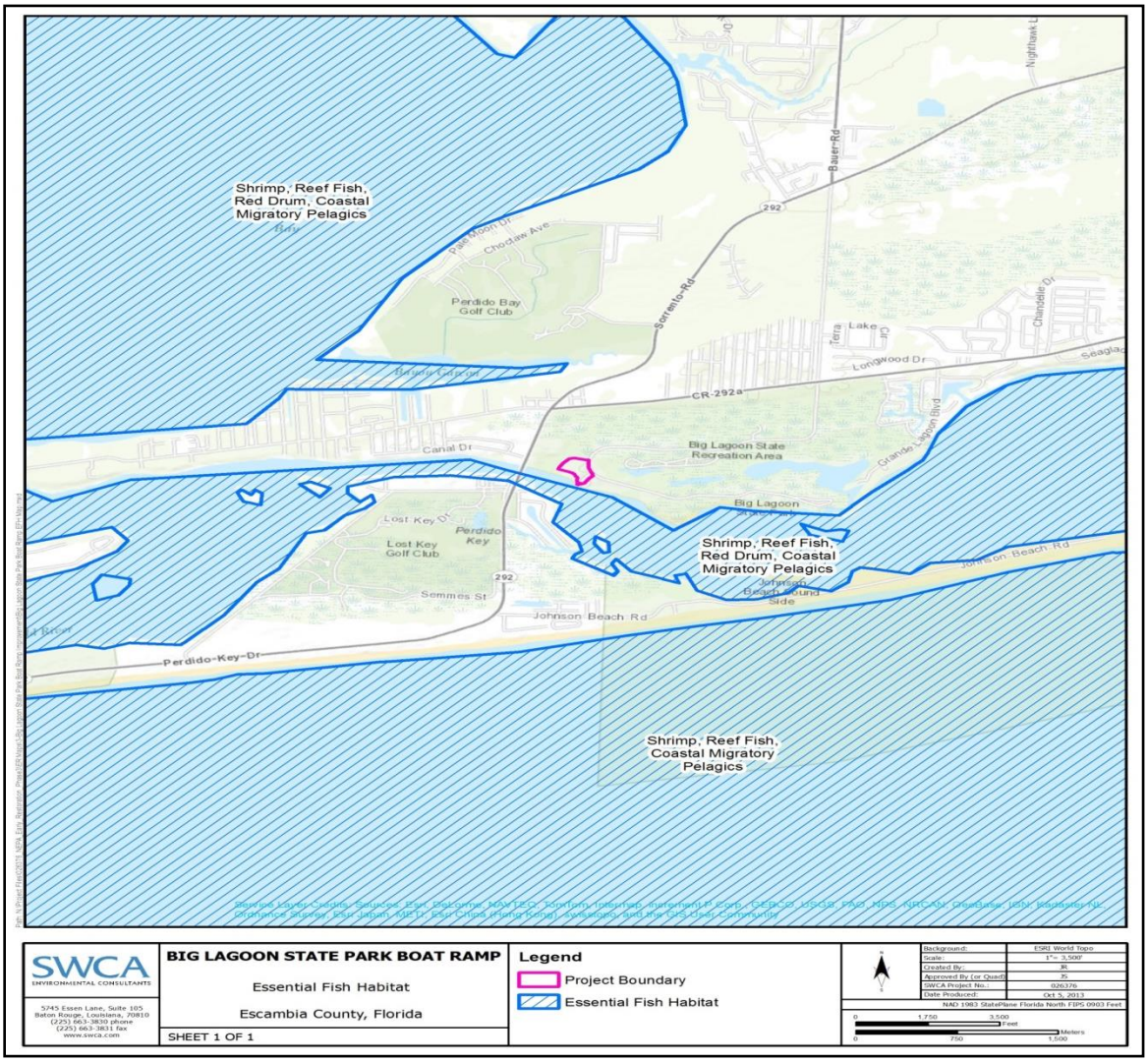


Figure 12-29. Essential fish habitat adjacent to Big Lagoon State Park.

Essential Fish Habitat (EFH)

EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse impacts on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. The EFH within the project area include emergent wetlands, mud substrate, and estuarine water columns for species of fish, such as red drum, brown shrimp, pink shrimp, and white shrimp. There are no marine components of EFH in the vicinity of the project site.

Table 12-31 provides a list of the species that NMFS manages under the federally Implemented Fishery Management Plan in the vicinity of the Big Lagoon State Park Boat Ramp Improvement site, Big Lagoon and Perdido Bay (EFH areas near the project are shown in**Figure 12-29**).

Table 12-31. Federally managed fisheries with designated Essential Fish Habitat (EFH) in the proposed project area.

EFH CATEGORY	SPECIES
Atlantic Highly Migratory Species	
	Atlantic Sharpnose Shark - Neonate
	Bull Shark - Adult
	Sandbar Shark - Neonate
	Scalloped Hammerhead Shark - Neonate
	Spinner Shark - Juvenile
	Tiger Shark - Juvenile
	Tiger Shark - Neonate
Coastal Migratory Pelagics of the Gulf of Mexico AND South Atlantic	
	Cobia
	King Mackerel
	Spanish Mackerel
Gulf of Mexico Red Drum	
	Red Drum
Gulf of Mexico Shrimp	
	Brown Shrimp
	Pink Shrimp
	White Shrimp
Reef Fish Resources of the Gulf of Mexico	
	Almaco Jack
	Banded Rudderfish
	Black Grouper
	Blackfin Snapper
	Blueline Tilefish
	Cubera Snapper
	Gag

EFH CATEGORY	SPECIES
	Goldface Tilefish
	Gray (Mangrove) Snapper
	Gray Triggerfish
	Greater Amberjack
	Hogfish
	Lane Snapper
	Lesser Amberjack
	Mutton Snapper
	Nassau Grouper
	Queen Snapper
	Red Grouper
	Red Snapper
	Scamp
	Silk Snapper
	Snowy Grouper
	Speckled Hind
	Tilefish
	Vermilion Snapper
	Warsaw Grouper
	Wenchman
	Yellowedge Grouper
	Yellowfin Grouper
	Yellowmouth Grouper

State-Listed Birds, MBTA and BGEPA

The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711) decreed that all migratory birds and their parts (including eggs, nests, and feathers) were fully protected. The migratory bird species protected by the Act are listed in 50 C.F.R. 10.13. More than 250 species of birds have been reported as migratory or permanent residents within the Pensacola Bay system, several of which breed there as well. These birds can be grouped generally as (1) species that occur year-round, both nesting and overwintering, (2) species that nest during the warm season and overwinter to the south, (3) species that overwinter and nest further north, and (4) species that pass through during spring migrations to more northern nesting sites and/or during fall migrations to overwintering areas. Different populations of the same species sometimes exhibit more than one type of migratory behavior. There are several State of Florida–listed bird species with potential to occur in and around the Park. These include the eastern brown pelican, little blue heron, southeastern American kestrel, least tern, black skimmer, and piping plover (discussed above).

The nearest known, active bald eagle nest is 4 miles east of the project area. One other active nest is nearly 10 miles northeast in Escambia Bay. There are no known bald eagle nests at the site, but there is potential for nesting in the Park due to the presence of bald eagle habitat such as open water, forests,

clearings, and swamp edges. Bald eagles have been observed flying over the Park (Florida Division of Recreation and Parks 2004).

The proposed project was also reviewed for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), respectively. Table 12-32 provides a summary of the different migratory bird groups specifically addressed by this review and summarizes the potential impacts to these groups and associated habitats that could result from the implementation of this project.

Table 12-32. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Shorebirds	Loafing/Foraging	Construction noise and increased human disturbance during construction and then during use of the boat ramp may cause birds to temporarily stop foraging or loafing or cause them to temporarily relocate. The Trusteesexpect that birds using the existing boat ramp are likely habituated to human activity and would not experience more than short-term impacts.
Seabirds	Resting, roosting, nesting	Seabirds forage in water and rest/roost in terrestrial habitats. Any startle effect will likely cause foraging or resting birds to move further down the shoreline within the park. Roosting should not be impacted because all work will occur during the day.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in Table 12-33.

Table 12-33. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Shorebirds	The Trusteesexpect foraging and resting birds would be able to move to another nearby location to continue foraging and resting. If project activities occur during shorebird nesting season (February 15 to August 31), the FWC will be contacted to obtain the most recent guidance to protect nesting shorebirds or rookeries and their recommendations will be implemented.
Seabirds	Care will be taken to minimize noise and physical disruptions near areas where foraging or resting birds are encountered. All disturbances will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity, which they will have. Roosting should not be impacted because the project will occur during daylight hours only. Nesting should not be impacted because the project will not occur near nesting habitats.

Environmental Consequences

Protected Species

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On March 20, 2014 the review of potential impacts to species managed by USFWS was completed (McClain, 2014). The USFWS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect the Perdido Key beach mouse, West Indian manatee, piping plover, and red knot (if listed). The USFWS also concurred with the Trustees'determination that the project will not adversely modify or destroy critical habitat for the Perdido Key beach mouse or piping plover. Finally, the USFWS review concurred with the Trustees'conclusion that five species of sea turtles in terrestrial habitats (green, hawksbill, Kemp's ridley, leatherback, and loggerhead) would experience no effect as a result of the proposed project.

Initiation of the consultation of potential impacts on protected species managed by NMFS was initiated on February 11, 2014. The Trustees'review of the potential impacts of the project for protected species managed by NMFS determined the proposed action "may affect, but is not likely to adversely affect" the following species and associated critical habitats in the project implementation area:

- Gulf Sturgeon - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Smalltooth Sawfish – The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Green Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Loggerhead Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Hawksbill Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Leatherback Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Kemp's Ridley Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.

A concurrence from NMFS with the Trustees'conclusions for these species and associated critical habitats is still pending.

The Trustees also evaluated the potential for take of Marine Mammals under the MMPA and due to these species' mobility and the implementation of NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006), *Standard Manatee Conditions for In-Water Work* (USFWS 2011), and USFWS recommended conservation measures for listed species and other trust resources, take of marine mammals under the MMPA is not anticipated.

Essential Fish Habitat

The proposed marina restoration would take place within the footprint of the existing facility. A very small area of subtidal habitat would be converted and disturbed during construction, however, this would take place within the existing developed boundaries where the habitat is already likely to be significantly disturbed as a result of the current use of the boat launch structure. Disturbance to species would be minor and brief and adjacent and similar habitat would be available for use during construction. As a result, the Trustees'review of potential impacts from the proposed project concluded it is not likely to adversely affect EFH.

On April 11, 2014 NMFS completed its evaluation of potential EFH impacts and concurred that the project construction is not likely to adversely affect EFH and any disturbance to species will be minor and brief (Fay, 2014).

State-Listed Birds, MBTA and BGEPA

State-listed birds may use habitat near the project area, and all migratory birds are protected under the MBTA. If construction activities were to occur during the nesting season (February 15 to August 13), birds could be disturbed by noise and human activity in the project area. In such circumstances, FWC nesting shorebird avoidance measures will be followed. These measures generally call for surveys within 300 feet and an avoidance buffer of 300 feet for nesting birds.

No bald eagles are known to nest in or adjacent to the Park; therefore, no impacts to bald eagles would be anticipated. However, if a bald eagle nest were observed in the vicinity of the project area, conservation measures provided by the USFWS and FWC would be implemented (see chapter 6 Appendix for specific measures). Consultation with the FWC concerning the proposed project and anticipated construction schedule relative to known bald eagle nest sites near the project area and the nesting season in Florida (October 1 to May 15) would be required prior to commencement of project activities. To minimize potential for impacts to nesting bald agles, the consultation protection measures may include 1) addressing prescribed nest tree protection zones, and 2) preparation of a bald eagle nest protection plan (including nesting behavior disturbance monitoring). Bald eagles have been known to tolerate certain potential disturbances in their breeding territories. Should these conservation measures be implemented for active nest sites adjacent to construction activities in the project area, potential impacts to the bald eagle would be short term and minor.

At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

Invasive Species

Affected Resources

Non-native invasive species could alter the existing terrestrial or aquatic ecosystem within, and possible expand out into adjacent areas after the initial introduction. The invasive species threat, once realized, could result in economic damages. Prevention is ecologically responsible and economically sound. Chapter 3 described more about the regulations addressing invasive species, pathways, impacts, and prevention. At this time specific invasive species that may be present on the project site or could be introduced through the project have not been fully identified. However, Chinese tallow (*Sapium*

sebiferum) is considered a significant exotic plant threat at the Park. Cogon grass (*Imperata cylindrica*) has also been identified around the box culvert flowing into the northwest portion of the Park, along Gulf Beach Highway, and along the main Park drive north of the entrance station.

Environmental Consequences

Best Management Practices (BMPs) to control the spread of any invasive species present, and prevent the introduction of new invasive species due to the project will be implemented. In general, best management practices would primarily address risk associated with vectors (e.g., construction equipment, personal protective equipment, delivery services, foot traffic, vehicles/ vessels, shipping material). There are many resources that provide procedures for disinfection, pest-free storage, monitoring methods, evaluation techniques, and general guidelines for integrated pest management that can be prescribed based upon specific site conditions and vectors anticipated. In addition, to best management practices, outreach and educational materials may be provided to project workers and potential users/visitors. Developed areas adjacent to the Park are a constant source of exotics. Also, improvements to the Park would likely attract additional visitors. Increased human presence could have a long-term minor effect on vegetation in the Park because of the greater likelihood of trampling, picking, or other vegetative disturbance, including accidential introduction or spread. This type of impact would probably occur in areas closest to Park facilities.

Management measures have been implemented that include efforts to survey and remove invasive plant species (Florida Division of Recreation and Parks 2006). Additionally, preconstruction vegetation surveys and preconstruction and postconstruction weed treatments would likely be required. The use of equipment and disturbance of soil and existing vegetation would also create a risk of noxious weed or invasive vegetative species introduction. Those undeveloped areas disturbed during construction would be monitored, and exotic species removed. The opportunity for the increased spread of non-native species would be temporary and localized, and would not be anticipated to displace native species populations and distributions.

Other measures that could be implemented are identified in the Chapter 6 Appendix. Due to the implementation of BMPs, the Trusteesexpect impacts due to invasive species introduction and spread to be short term and minor.

12.15.5.7 Human Uses and Socioeconomics

12.15.5.7.1 Socioeconomics and Environmental Justice

Affected Resources

The proposed project would be in Escambia County, which is Florida's nineteenth most populous county. Escambia County contains 1.6% of Florida's population (Florida Office of Economic and Demographic Research [FOEDR] 2013a). Home to approximately 300,000 residents, the county has an annual budget of more than $370 million. Pensacola is the county seat. Escambia County contains the U.S. Navy's first operating air station and flight school (Escambia County 2013).

According to census data, 87.1% of the county's residents are high school graduates (or higher), and 23.3% have bachelor's degrees or higher (compared to 85.5% for high school graduates and 26.0% for bachelor's degrees in the state of Florida as a whole). The 2012 crime rate (index crimes per population of 100,000) was 4,895.5, which was higher than the state of Florida's 3,805.8 (FOEDR 2013a).

Census data indicate that 23.6% of Escambia's residents are employed in the trade, transportation, and utilities industry; 18.7% in professional and business services; 11.7% in education and health services; 11.0% in construction; 10.3% in financial activities; 10.2% in leisure and hospitality; and the remaining population in such industries as natural resources and mining, manufacturing, information, government, and other services. The county unemployment rate in 2012 was 8.4% (8.6% for the state of Florida), with 59.9% of the population in the labor force (FOEDR 2013a).

Data and characteristics of the population of Escambia County are summarized and compared to those for the population of the state as a whole in Table 12-34. Escambia County is in the Pensacola-Ferry Pass-Brent Metropolitan Statistical Area (MSA). Population growth increased 1.3% from 2010 to 2012 and 8.9% from 2000 to 2010 in this MSA. Escambia County is projected to grow to a population of 322,330 by 2040 (FOEDR 2013b). As seen in the table, Escambia County has similar racial and economic/income demographic characteristics as Florida as a whole.

Table 12-34. Population characteristics of Escambia County compared with State of Florida data.

PEOPLE QUICK FACTS	ESCAMBIA COUNTY	FLORIDA
Population, 2012 estimate	302,715	19,317,568
Persons under 5 years, 2012	6.2%	5.5%
Persons under 18 years, 2012	21.1%	20.7%
Persons 65 years and over, 2012	15.2%	18.2%
Female persons, 2012	50.5%	51.1%
White alone, 2012[1]	70.1%%	78.3%
Black or African American alone, 2012[1]	22.9%	16.6%
American Indian and Alaska Native alone, 2012[1]	0.9%	0.5%
Asian alone, 2012[1]	2.9%	2.7%
Native Hawaiian and Other Pacific Islander alone, 2012[1]	0.2%	0.1%
Two or More Races, 2012	3.0%	1.9%
Hispanic or Latino, 2012[2]	5.1%	23.2%
White alone, not Hispanic or Latino, 2012	66.0%	57.0%
Homeownership rate, 2007–2011	67.3%	69.0%
Median household income, 2007–2011	$43,707	$47,827
Persons below poverty level, 2007–2011	16.9%	14.7%
Manufacturers' shipments, 2007 ($1,000)	2,117,030	104,832,907
Merchant wholesaler sales, 2007 ($1,000)	11,838,916	221,641,518
Retail sales, 2007 ($1,000)	4,055,667	262,341,127

Source: U.S. Census Bureau State and County (2013).
[1] Includes persons reporting only one race.
[2] Hispanics may be of any race, so also are included in applicable race categories.

Environmental Consequences

The proposed project would create approximately 662 worker days of employment during construction (see **Table 12-26**). The improved access to Big Lagoon may result in a minor to moderate increase in visitation to the Park because of the substantial improvement of Park facilities. As a result, the local economy could benefit over the long term through the economic activity generated through fees, new jobs, and purchases from recreational visitors (food, fuel, food, equipment, etc.). This project would not create a benefit for any specific group or individual, but rather would produce benefits realized by the local community and visitors. Overall, only a few individuals, groups, and properties would be affected;

therefore, the overall impact is expected to be minor and would not substantively alter socioeconomic conditions.

Escambia County has similar racial and economic/income demographic characteristics as Florida as a whole. Thus, there are no indications that the Park improvements would be contrary to the goals of Executive Order 12898, or would create disproportionate, adverse human health or environmental impacts on minority or low-income populations of the surrounding community. Therefore, no short-term or long-term environmental justice issues would be anticipated.

12.15.5.7.2 Cultural Resources

Affected Resources

A review of the Florida Master Site File indicates that there are at least three previously recorded prehistoric archaeological sites located within 1 mile of the existing boat ramp (FDHR 2013).

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Environmental Consequences

The lands in the Park have been used by humans for thousands of years. The area is culturally rich and has a diversity of previously recorded archaeological sites that range from prehistoric to modern era.

The proposed construction would involve ground-disturbing activities. Project plans for the Park improvements have not been finalized. Once the project plans are finalized, the area would be subjected to a Phase I cultural resources survey. Based on the results of the survey, project plans would be altered to avoid any historic properties that would be adversely affected by the project work (ground disturbance and construction).

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

12.15.5.7.3 Infrastructure

Affected Resources

The following infrastructure currently exists as part of Big Lagoon State Park:

- Park roads (2.6 miles)
- Service roads (3 miles)
- Parking areas
- An amphitheater seating 300 people (with a lighting system and stage)
- Boardwalks
- Observation platforms

- Restrooms
- Playgrounds
- Five miles of hiking and nature trails with interpretive exhibits
- A four-story wooden observation tower at the east beach area
- A boat ramp
- A full-service campground with 75 sites, electricity, picnic tables, fire rings, three restrooms, and a dump station
- A tent camping area accommodating up to 60 people with a group fire ring, water spigots, and a restroom with showers
- Fifteen family-style picnic pavilions, seating 10–150 people
- Picnic tables
- Public showers for day visitors
- An entrance station/administrative office
- A temporary office building
- A ranger residence
- A shop building, a three-bay equipment shelter, and several sheds

Park water is acquired from Escambia County's municipal water supply. Sewage is disposed of through septic tanks and drain-field systems (Florida Division of Recreation and Parks 2006).

Environmental Consequences

Construction of the new restroom would require connection to the ECUA regional sanitary sewer collection system. The impact to the regional system would be long term but minor because it would be localized and within operational capacity. Local water quality should benefit because of the removal of a septic tank system near surface waters. Visitor experience at the Park would be improved with the provision of a new restroom, reducing crowding. A sanitary sewer collection system permit would be obtained from the FDEP.

Other changes to infrastructure (the addition of a lane to the boat ramp, improvement of traffic circulation at the boat ramp, and the expansion of boat trailer parking) would have a beneficial, long-term impact because they would improve the visitor experience. A minor, long-term increase in the pace of the need for maintenance of existing facilities could occur if visitor use increased due to better infrastructure at the Park; minor increases in local daily traffic volumes could also occur, resulting in perceived inconveniences to drivers but no actual disruption of traffic.

12.15.5.7.4 Land and Marine Management

Affected Resources

The land use surrounding the Park to the west, north, and east is primarily residential with a few recreational facilities and some commercial businesses. Big Lagoon is located to the south, and on the south edge of Big Lagoon is a long, narrow spit of land called Johnson Beach. Perdido Key, an unincorporated community on a barrier island, is located southwest of the Park.

The Park is managed by the FDEP, Florida Division of Recreation and Parks, under the 2006 *Big Lagoon State Park Unit Management Plan*. Under this plan, public outdoor recreation is the designated single use of the property. Major emphasis is placed on maximizing the recreational potential of the area;

however, preservation of resources is also important (Florida Division of Recreation and Parks 2006). The Park has designated the basin swamp, baygall, estuarine tidal marsh, and scrub communities as protected zones, defined as areas of high sensitivity or outstanding character from which most types of development are excluded. Generally, facilities requiring extensive land alteration or more intensive use such as parking lots and camping areas are not allowed in protected zones. Facilities with minimal resource impacts such as trails, interpretive signs, and boardwalks are generally allowed (Florida Division of Recreation and Parks 2006).

The project would be located in a coastal area that is regulated by the federal Coastal Zone Management Act (CZMA) of 1972, and the Florida Coastal Management Act of 1978.

The Park is adjacent to the Fort Pickens Aquatic Preserve. It is also a component of the Florida Greenways and Trails System, a statewide system of greenways and trails.

Environmental Consequences

Although the action would require several permits for the short-term construction period, it would not require a variance, zoning change, or amendment to a land use area or comprehensive management plan. The long-term impact of the project would be minor because it would not affect overall use and management beyond the local Park area. It would be consistent with current land use because construction would take place in an already developed area of the Park. It would also be consistent with and support the *Big Lagoon State Park Unit Management Plan*, which has a recreational goal of expanding parking, improving circulation, and constructing a restroom at the boat ramp area (Florida Division of Recreation and Parks 2006).

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS. The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process.

12.15.5.7.5 Aesthetics and Visual Resources

Affected Resources

Existing aesthetics and visual resources from the project site are views of a minimally developed area. Views include those of a sandy shoreline, Park vegetation such as trees, Big Lagoon, an access road, and Park facilities (parking lots, boat ramp, and several small structures).

Environmental Consequences6

Short-term introduction of unnatural elements to the existing visual landscape would occur during construction activities due to the presence of equipment and materials. These impacts would be minor because they would only be visible from a small portion of the Park, would not dominate the viewshed, and would not detract from current visitor activities. Long-term changes to visual resources would occur from the addition of a boat ramp and restroom as well as the expansion of boat trailer parking. These changes would be readily apparent but minor because they are consistent with other state park facilities and would not attract attention, dominate the view, or detract from visitor experiences.

12.15.5.7.6 Tourism and Recreational Use

Affected Resources

Park use from January 1, 2012, through December 31, 2012, included 44,734 overnight campers and 80,239 day use visitors for a total of 124,973 Park visitors. The Park sold 644 annual passes. Approximately two-thirds were after-hour use passes for launching boats before or after Park hours. The Park estimates that the minimum number of boat launches had been 10 per day over the 2012 year. On many days, the boat ramp was filled, and boaters were turned away (personal communication between M. Domini and Pearce Barrett on September 26, 2013).

Recreation at the Park currently includes boating, swimming, fishing, canoeing/kayaking, hiking, camping, windsurfing, picnicking, wildlife viewing, and nature appreciation.

Environmental Consequences6

During the construction period, visitor recreational experience would be negatively impacted by noise and visual disturbances associated with the use of construction equipment. The impact would be short term and minor because it would only affect some recreationalists in the boat ramp area for a limited period of time (up to 1 year). Users would likely be aware of the construction, but changes in use would be slight. The construction process would also limit recreational activities near construction areas to protect public safety, which would be a minor short-term inconvenience to visitors. Over the long term, minor beneficial impacts to tourism and recreational use would be expected due to the enhancement of recreational opportunities associated with improved facilities and accessibility. Fewer boaters would need to be turned away due to crowding.

12.15.5.8 Public Health and Safety and Shoreline Protection

Affected Resources

The management of hazardous materials is regulated under various federal and state environmental and transportation laws and regulations, including the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Emergency Planning and Community Right-to-Know Act; and the Hazardous Materials Transportation Act. The purpose of the regulatory requirements set forth under these laws is to ensure the protection of human health and the environment through proper management (identification, use, storage, treatment, transport, and disposal) of these materials. Some of these laws provide for the investigation and cleanup of sites that have already been contaminated by releases of hazardous materials, wastes, or substances.

A review of the EPA's EnviroMapper revealed that there are no CERCLA sites on or immediately adjacent to the Park. There are several nearby facilities that produce hazardous waste, including an automotive facility, a pharmacy, and an alloy company. The Park itself is a conditionally exempt small-quantity generator of hazardous waste (EPA 2013c).

The Park's shoreline is a highly dynamic area subject to both erosion and accretion. Periodic maintenance dredging of the Intracoastal Waterway further influences currents and long shore drift that affect physical changes along the Park's shoreline. Recent increases in commercial barge traffic and dredge operations have also occasionally impacted the shore. Sand accumulation at the boat ramp is a problem that needs to be addressed (Florida Division of Recreation and Parks 2006). The *Big Lagoon State Park Unit Management Plan* recommends that additional plantings of emergent vegetation occur

west of the boat ramp, and the plan is working toward a long-term solution to sand accretion at the boat ramp and erosion to the west. The shoreline will be managed by the Florida Division of Recreation and Parks (FDRP) in cooperation and coordination with the Office of Coastal and Aquatic Managed Areas, FDEP Bureau of Beach and Coastal Systems, and the USACE as necessary.

Environmental Consequences

Project construction would require mechanical equipment that uses oil, lubricants, and fuels. The contractor would be required to take appropriate actions to prevent, minimize, and control the spill of construction-related hazardous materials, and to avoid releases and spills. If a release should occur, it would be handled promptly in accordance with all applicable regulations. The period of time during which a release could occur from construction activities would be short term, and any release would be expected to be minor.

The principal impacts of the proposed project on public health and safety would be related to the potential mobilization of hazardous waste from excavation and handling of sediments containing oil, heavy metals, or other materials, which could result in exposure to the environment and workers. Sediment analysis for contaminants at the boat ramp site and potential borrow pits would be completed and analyzed prior to project implementation. If hazardous materials were encountered in the project area during construction activities, appropriate measures for the proper assessment, remediation, management, and disposal of the contamination would be required in accordance with applicable federal, state, and local regulations. The period of time during which mobilization of hazardous waste from sediments could occur from construction activities would be short term. Because sediments analysis would occur and appropriate handling and management measures would be taken, impacts to public health and safety are expected to be minor. All occupational and marine safety regulations and laws would be followed to ensure safety of all workers and monitors.

No impact is expected to the shorelines because of the protective erosion control measures and BMPS that would be used. Shoreline integrity would remain intact, and there would be no increased risk of potential hazards (e.g., increased likelihood of storm surge) to visitors or residents.

12.15.6 Summary and Next Steps

The proposed Big Lagoon State Park project would involve enhancing an existing boat ramp and surrounding facilities in the Big Lagoon State Park in Escambia County. These improvements would include adding an additional lane to the boat ramp, expanding boat trailer parking, improving traffic circulation at the boat ramp, and providing a new restroom facility to connect the park to the Emerald Coast Utility Authority (ECUA) regional sanitary sewer collection system. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories may occur, no moderate to major adverse impacts are anticipated to result. The project would enhance and/or increase recreational boating and fishing opportunities by improving the existing boat ramp area. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

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12.16 Bob Sikes Pier, Parking and Trail Restoration: Project Description

12.16.1 Project Summary

The proposed Bob Sikes Pier project would improve access to a fishing pier in the Pensacola area in Escambia County as well as enhancing the quality of the experience for its recreational users. The proposed improvements include renovating parking areas, enhancing bicycle/pedestrian access, and aesthetic improvements to the surrounding area. The estimated cost for this project is $1,023,990.

12.16.2 Background and Project Description

The Trustees propose to improve and enhance the Bob Sikes pier (see Figure 12-30 for project location). At 1,800 feet in length, the Bob Sikes Fishing Pier is the longest fishing pier in the Pensacola area as well as the only free fishing pier on Santa Rosa Island. Historically, the Bob Sikes fishing pier has provided an opportunity for the general public to access Santa Rosa Sound for fishing and sightseeing.

The objective of the proposed Bob Sikes Pier Restoration project is to enhance and/or increase recreational fishing and beach use opportunities by improving the access to the existing fishing pier and associated beach access trail. The restoration work proposed includes: 1) adding solar-powered lighting to illuminate dark areas along the pier; 2) completing a series of minor pier and rail modifications to generally improve the pier's safety; 3) renovating and rehabilitating designated parking areas to improve parking efficiency of visitors and to improve traffic flow leading into and within the pier parking lot; 4) adding a *Bob Sikes Pier* entrance sign and informational/educational signage for pier users (e.g., proper actions to take if a sea turtle should be hooked while fishing); 5) widening and enhancing half mile section of multipurpose (bicycle/pedestrian) access trail that connects the Bob Sikes Fishing Pier to other recreational and commercial areas on the beach; and 6) aesthetic improvements to the parking area, parking access road and multipurpose trail leading to Bob Sikes Pier. The parking renovations, solar lighting and new signage are needed to enhance and/or increase access to the pier, which will make the public's recreational fishing and beach use opportunities more accessible, functional or fully utilized.

Figure 12-30. Location of envisioned Bob Sikes Pier Restoration Project.

12.16.3 Evaluation Criteria

This proposed project meets the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and related response actions, the public's access to and enjoyment of the natural resources along Florida's Panhandle was denied or severely restricted. The proposed Bob Sikes Pier, Parking and Trail Restoration project is intended to enhance and/or increase recreational fishing and beach use opportunities by improving access to the existing fishing pier and the associated beach access trail. The project would enhance and/or increase opportunities for the public's use and enjoyment of the natural resources, helping to offset adverse impacts to such uses that resulted from the Spill. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

The project is technically feasible and utilizes proven techniques with established methods and documented results and can be implemented with minimal delay. Florida counties have successfully completed projects of similar scope throughout Florida over many years. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Furthermore, cost estimates are based on similar past projects and therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.16, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.16 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). Finally, this project is not anticipated to negatively affect regional ecological restoration and is therefore not inconsistent with the long-term restoration needs of the State of Florida. See Sections 6d of the Framework Agreement.

Many recreational use projects, including ones similar to this project, have been submitted as restoration projects on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Bob Sikes Pier Restoration project also meet the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by response and SCAT activities for the Spill.

12.16.4 Performance Criteria, Monitoring and Maintenance

As part of the project cost, monitoring will be conducted to ensure project plans and designs were correctly implemented. Monitoring has been designed around the project goals and objectives. The project objective is to enhance and/or increase recreational fishing and beach use opportunities by improving access to the existing pier and the associated beach access trail. Performance monitoring will evaluate: 1) the addition of solar-powered lighting; 2) the completion of a series of minor pier and rail modifications; 3) renovation and rehabilitation of designated parking areas; 4) construction of informational/educational signage; 5) enhancement of bicycle/pedestrian access trail;; and 6) the completion of the aesthetic improvements to the parking area, parking access road and multipurpose trail leading to Bob Sikes Pier. Specific success criteria include: 1) the completion of the construction as designed and permitted, and 2) enhanced and/or increased access is provided to the natural resources, which will be determined by observation that the pier is open and available.

Long-term monitoring and maintenance of the improved facilities will be completed by Escambia County as part of their regular public facilities maintenance activities. Funding for this post-construction maintenance is not included in the previously provided value for the project cost and will be accomplished by Escambia County.

During the one year construction performance monitoring period, the Florida Trustees' Project Manager will go out twice to the site to record the number of users. Following the post construction performance monitoring period, the Escambia County will monitor the recreational use activity at the site. Escambia County will visit the site twice a year to count the number of users at the fishing pier. The visitation numbers will then be provided to the Florida Department of Environmental Protection.

12.16.5 Offsets

The Trustees and BP negotiated a BCR of 2.0 for the proposed recreational use project. NRD Offsets are $2,047,980 expressed in present value 2013 dollars to be applied against the monetized value of lost recreational use provided by natural resources injured in Florida, which will be determined by the

Trustees' assessment of lost recreational use for the Oil Spill. Please see Chapter 7 of this document (Section 7.2.2) for a description of the methodology used to develop monetized Offsets.[17]

12.16.6 Cost

The total estimated cost to implement this project is $1,023,990. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and contingencies.

[17] For the purposes of applying the NRD Offsets to the calculation of injury after the Trustees' assessment of lost recreational use for the Spill, the Trustees and BP agree as follows:

- The Trustees agree to restate the NRD Offsets in the present value year used in the Trustees' assessment of lost recreational use for the Spill.
- The discount rate and method used to restate the present value of the NRD Offsets will be the same as that used to express the present value of the damages.

12.17 Bob Sikes Pier, Parking and Trail Restoration: Environmental Review

The proposed Bob Sikes Pier project would improve access to a fishing pier in the Pensacola area in Escambia County while enhancing the quality of the experience for its recreational users. The proposed improvements include renovating parking areas, enhancing bicycle/pedestrian access, and aesthetic improvements to the surrounding area.

12.17.1 Introduction and Background

In April 2011, the Natural Resource Trustees (Trustees) and BP Exploration and Production, Inc. (BP) entered into the Framework Agreement for Early Restoration Addressing Injuries Resulting from the Deepwater Horizon Oil Spill (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is underway. The Framework Agreement is intended to expedite the start of restoration in the Gulf in advance of the completion of the injury assessment process. Early restoration is not intended to, and does not fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects would be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement for Early Restoration Addressing Injuries Resulting from the Deepwater Horizon Oil Spill (Framework Agreement), the Trustees released, after public review of a draft, a Phase I Early Restoration Plan (ERP) in April 2012. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, the National Oceanic and Atmospheric Administration (NOAA) issued a public notice in the Federal Register on behalf of the Trustees announcing the development of additional future Early Restoration projects for a Draft Phase III Early Restoration Plan (ERP). This boat ramp project was submitted as an Early Restoration project on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida. In addition to meeting the evaluation criteria for the Framework Agreement and the Oil Pollution Act (OPA), the project meets Florida's criteria that Early Restoration projects occur in the eight-county Florida panhandle area that deployed boom and was impacted by the Spill.

The Trustees propose to improve and enhance the Bob Sikes pier (Figure 12-30). At 1,800 feet in length, the Bob Sikes Fishing Pier is the longest fishing pier in the Pensacola area as well as the only free fishing pier on Santa Rosa Island. Historically, the Bob Sikes fishing pier has provided an opportunity for the general public to access Santa Rosa Sound for fishing and sightseeing.

The proposed restoration would enhance and/or increase the recreational fishing and beach use opportunities by improving the access to the existing fishing pier and associated beach access trail. The restoration work proposed includes: 1) adding solar-powered lighting to illuminate dark areas along the pier; 2) completing a series of minor pier and rail modifications to generally improve the pier's safety; 3) renovating and rehabilitating designated parking areas to improve parking efficiency of visitors and to improve traffic flow leading into and within the pier parking lot; 4) adding a *Bob Sikes Pier* entrance sign and informational/educational signage for pier users (e.g., proper actions to take if a sea turtle should be hooked while fishing); 5) widening and enhancing half mile section of multipurpose (bicycle/pedestrian) access trail that connects the Bob Sikes Fishing Pier to other recreational and commercial areas on the beach; and 6) aesthetic improvements to the parking area, parking access road and multipurpose trail leading to the Bob Sikes pier.

The total estimated cost to implement this project is $1,023,990. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and contingencies.

12.17.2 Project Location

The proposed Project is located in the State of Florida, Escambia County. The pier runs parallel to the Pensacola Beach Boulevard Bridge (Highway 399) that spans the Santa Rosa Sound. Figure 12-30 shows project location.

12.17.3 Construction and Installation

Proposed construction and installation associated with restoration of the Bob Sikes Pier includes:

- Installation of solar lighting on the existing pier using appropriate construction equipment.
- Modifications to the pier and rail, designed to improve access for handicap users and improve safety of the pier, will be completed using appropriate construction equipment.
- Improvements to parking lot
    - Demolish and renovate using heavy construction equipment and hand-held tools, as appropriate.
    - Improve handicap parking areas, including replacing signs and striping.
- Improvements to recreational path
    - Widen and enhance path, via removal of old material, re-routing some areas of the path, and paving the repaired area.
    - Reroute road leading to the parking area to improve traffic flow and safety.
    - Remove old road material and replace using heavy equipment to reroute, regrade, and pave the new road surface.

Any improvements would be implemented using heavy equipment and hand held tools, as necessary. Project construction would begin 4 to 6 months after funding is received, with construction scheduled to last from 7 to 12 months.

12.17.4 Operations and Maintenance

Long-term monitoring and maintenance of the improved facilities will be completed by Escambia County as part of their regular public facilities maintenance activities. Funding for this post-construction maintenance is not included in the previously provided value for the project cost and will be accomplished by Escambia County.

During the one year construction performance monitoring period, the Florida Trustees' Project Manager will go out twice to the site to record the number of users. Following the post construction performance monitoring period, the Escambia County will monitor the recreational use activity at the site. Escambia County will visit the site twice a year to count the number of users at the fishing pier. The visitation numbers will then be provided to the Florida Department of Environmental Protection.

12.17.5 Affected Environment and Environmental Consequences

12.17.5.1 No Action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

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

12.17.5.2 Physical Environment

12.17.5.2.1 Geology and Substrates

Affected Resources

The Bob Sikes Pier runs parallel to the Pensacola Beach Boulevard Bridge (Highway 399) that spans the Santa Rosa Sound with proposed project site being located on the northern portion of the Santa Rosa Island. The majority of the project area has previously been developed leaving few areas of undisturbed soils remaining, and for those soils remaining that have not been developed most have been previously impacted through landscaping. Areas remaining void of development primarily consist of sand and are classified by the United States Department of Agriculture Natural Resources Conservation Services (USDA NRCS) as Arents-Urban land, a soil type primarily impacted by development with remaining undeveloped soils having low erosion potential, gradual slopes and that is somewhat poorly drained with some tendency for ponding (USDA NRCS 2013).

Environmental Consequences

Construction and construction activities associated with the widening and enhancement of the multipurpose access trail, the elimination of the directional north bound right turn lane and the enhancement/landscaping around the parking area, access road and trail will expose, modify and compact soils in the project footprints, impacting approximately 1-3 acres. Construction activities would likely include the use of a backhoe or bobcat and construction staging is anticipated to occur in an existing parking lot. Impacts to soils would occur as a result of construction and construction activities and would only occur during the construction period. Specific mitigation measures would be implemented during campground construction. These would include following established best management practices (BMPs) such as the implementation of an erosion control and storm water management plan, the installation of sediment traps prior to commencement of construction activities; and on-going construction monitoring to ensure compliance. Based on previous disturbances to the project area soils, the relatively small area and amount of soils impacted and the nature of construction activities, alterations to soil through fill, compaction, grading, and earth moving activities would result in long and short-term, minor adverse impacts to affected soils.

Given that there would be no substantial change in uses at the project area following implementation of the proposed rehabilitation activities, it is anticipated that there would be no long-term negative impacts to soils as a result of site use.

12.17.5.2.2 Hydrology and Water Quality

Affected Resources

The site is located over Santa Rosa Sound, adjacent to the Pensacola Beach Bridge. The pier extends over open waters of Santa Rosa Sound. Pensacola Bay and the waters surrounding the project area have been impacted by numerous non-point and point source pollution sources resulting in a reduction of natural biodiversity and productivity. Hydrology and water quality are influenced by substantial urban development throughout the area surrounding the project site.

Environmental Consequences

Project Activities are not anticipated to require construction in water however, based on construction activities on-land it is possible that some impacts via turbidity and the potential for increased sediment released into water could occur. It is anticipated that all impacts would be short-term in nature occurring only during construction resulting in short-term, minor, adverse impacts to water quality. BMPs along with other avoidance and mitigation measures required by state and federal regulatory agencies would be employed to minimize any water quality and sedimentation impacts. Impacts to hydrologic and water quality resources are expected to be minimal. The proposed project is not anticipated to require authorization by the U.S. Army Corps of Engineers pursuant to the Clean Water Act Section 404 and/or Rivers and Harbors Act (CWA/RHA).

Long-term, the planned improvements to the parking area, including re-paving and planting native vegetation in appropriate areas, would have a minor beneficial impact on water quality.

12.17.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

The U.S. Environmental Protection Agency (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 (CAA) and the 1977 and 1990 Clean Air Act Amendments (CAAA), the 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, the USEPA has issued NAAQS for seven criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO2), particles with a diameter less than or equal to a nominal 10 micrometers (PM10), particles with a diameter less than or equal to a nominal 2.5 micrometers (PM2.5), ozone (O3), nitrogen dioxide (NO2), and lead (Pb). Individual states may promulgate their own ambient air quality standards for these “criteria” pollutants, provided that they are at least as stringent as the federal standards. In Table 12-35, below, both State of Florida and federal primary ambient air quality standards for criteria air pollutants are presented.

The project is located in a developed urban area and is adjacent to a large roadway. The surrounding upland habitat is a developed residential and commercial area. In 2013, Escambia County was in attainment of the NAAQS for all criteria pollutants as designated by the USEPA (USEPA 2010).

The USEPA proposed strengthening the air quality standards for ground-level ozone to 0.075 ppm in 2008. To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. The 2006 to 2008 average of the fourth-highest daily maximum 8-hour ozone concentration

for Pensacola was 0.079 ppm, and thus Escambia County would be designated as nonattainment according to the proposed 2008 ozone standard (USEPA 2009a).

Table 12-35. State and Federal ambient standards for criteria air pollutants.

POLLUTANT	AVERAGING PERIOD	FEDERAL PRIMARY STANDARD	STATE OF FLORIDA STANDARD
Ozone	8-hour	0.075 ppm	Same as Federal
	1-hour (daily max.)	0.12 ppm	Same as Federal
PM2.5	Annual (arithmetic mean)	15.0 µg/m3	Same as Federal
	24-hour	35 µg/m3	Same as Federal
PM10	Annual (arithmetic mean)	NA	50 µg/m3
	24-hour	150 µg/m3	150 µg/m3
Carbon Monoxide	8-hour	9 ppm	9 ppm
	1-hour	35 ppm	35 ppm
Nitrogen Dioxide	Annual (arithmetic mean)	0.053 ppm	0.05 ppm
	1-hour	0.100 ppm	Same as Federal
Sulfur Dioxide	Annual (arithmetic mean)	0.03 ppm	0.02 ppm
	24-hour	0.14 ppm	0.10 ppm
	1-hour (per annum)	NA	0.40 ppm
	1-hour (per 7 days)	NA	0.25 ppm
	5-minute	NA	0.80 ppm
Lead	Rolling 3-month average	0.15 µg/m3	Same as Federal
	Quarterly average	1.5 µg/m3	Same as Federal
Total Suspended Particulate	Annual (geometric mean)	NA	60 µg/m3
	24-hour	NA	150 µg/m3

Greenhouse gases (GHGs) are chemical compounds found in the Earth's atmosphere that absorb and trap infrared radiation as heat. Global atmospheric GHG concentrations are a product of continuous emission (release) and removal (storage) of GHGs over time. In the natural environment, this release and storage is largely cyclical. For instance, through the process of photosynthesis, plants capture atmospheric carbon as they grow and store it in the form of sugars. Human activities such as deforestation, soil disturbance, and burning of fossil fuels disrupt the natural cycle by increasing the GHG emission rate over the storage rate, which results in a net increase of GHGs in the atmosphere. The principal GHGs emitted into the atmosphere through human activities are CO2, methane, nitrous oxide, and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (USEPA, 2011). CO2 is the major GHG emitted, and the burning of fossil fuels accounts for 81 percent of all U.S. GHG emissions (USEPA 2009b).

Implementation of the proposed project would include transportation and heavy construction equipment which may include a backhoe, bulldozer and a dump truck.

Environmental Consequences

Project implementation would require the use of heavy equipment which would temporarily affect air quality in the project vicinity due to construction vehicle emissions. Excavation activities associated with the construction portions of the project may produce fine particulate matter. Available BMPs would be employed to prevent, mitigate, and control potential air pollutants during Project implementation. Any air quality impacts that would occur would be localized, short in duration and minimal based on the fact that the majority of construction would consist primarily of renovations to existing structures overall impacts to air quality would be short-term and minor. The implementation of solar-powered lighting along the pier as opposed to fossil fuel powered lights would result in a minor beneficial impact on air quality and GHG emissions through the reduction in the amount of fossil fuel used. Long-term, the site may experience some increase in use by the public but the renovations are expected to improve efficiency and changes in air quality and GHG are expected to be minor in the long-term.

The use of gasoline and diesel-powered construction vehicles and equipment, including cars, trucks, bulldozers, dump trucks and backhoes, would contribute to an increase in GHG emissions. The following table describes the likely GHG emission scenario for the implementation of this project.

Based on the assumptions described in Table 12-36, and the small scale and short duration of the construction portion of the proposed project, predicted GHG emissions would be short-term and minor and would not exceed 25,000 metric tons of CO2e per year. Available BMPs would be employed to reduce the release of GHGs during implementation. Based on the small scale and short duration of the project, GHG emissions in the project staging and deployment areas would be minimal. Therefore, any increase in GHG emissions would be short-term and minor.

12.17.5.2.4 Noise

Affected Resources

Noise can be defined as unwanted sound and noise levels, and impacts are interpreted in relationship to its impacts on nearby residents. Noise associated with recreational land uses, such as boating, can be of concern to surrounding communities. Noise also emanates from vehicular traffic associated with new facilities and from Project sites during construction. Ambient noise (the existing background noise environment) can be generated by a number of noise sources, including mobile sources, such as airplanes, automobiles, trucks, and trains; and stationary sources such as construction sites, machinery, or industrial operations.

Table 12-36. Projected project greenhouse gas emissions.

VESSEL/CONSTRUCTION EQUIPMENT	NO. OF HOURS OPERATED[18]	CO2 (METRIC TONS)[19]	CH4 (CO2E) (METRIC TONS)[20]	NOX (CO2E) (METRIC TONS)	TOTAL CO2E (METRIC TONS)
Grader (1)	320	125	0.10	0.10	125.20
Barge[21] (1)	640	10,240	19.2	76.8	10,336
Backhoe[22] (1)	960	336	0.19	0.19	336.38
Dumptruck[23] (1)[24]	48	16	0.01	0.01	16.02
TOTAL					**10,813.60**

The Noise Control Act of 1972 (42 U.S.C. 4901 to 4918) was enacted to establish noise control standards and to regulate noise emissions from commercial products such as transportation and construction equipment. The standard measurement unit of noise is the decibel (dB), which represents the acoustical energy present. Noise levels are measured in A-weighted decibels (dBA), a logarithmic scale which approaches the sensitivity of the human ear across the frequency spectrum. A 3-dB increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear. Table 12-37 presents some familiar sounds and their decibel levels.

Table 12-37. Familiar sounds and their decibel levels.

SOUND	DECIBEL LEVEL (DB)
Whisper	30
Normal Conversation	50-65
Vacuum cleaner at 10 feet	70
Midtown Manhattan Traffic Noise	70-85
Lawnmower	85-90
Train	100
Nearby Jet Takeoff	130

Source: Occupational Health and Safety Administration 2012

[18] Emissions assumptions for all equipment based on 240 10-hour days of operation per piece of equipment over a 12-month construction period.

[19] CO_2 emissions assumptions for diesel and gasoline engines based on U.S. EPA 2009

[20] CH_4 and NOx emissions assumptions and CO_2e calculations based on U.S. EPA 2011

[21] GHG emission estimates were not available for a barge. In order to present the highest estimate, GHG estimates for a tugboat were used.

[22] GHG emission estimates were not available for a Bobcat. In order to present the highest estimate, GHG estimates for a backhoe were used.

[23] GHG emission estimates were not available for a tractor trailer. In order to present the highest estimate, GHG estimates for a dumptruck were used.

[24] Construction equipment emission factors based on U.S EPA NONROAD emission factors for 250hp pieces of equipment. Data was accessed through the California Environmental Quality Act Roadway Construction Emissions Model.

The primary sources of ambient (background) noise in the project area are operation of vehicles, commercial and recreational vessels, the nearby Pensacola Airport and natural sounds such as wind and wildlife. City noise is mainly from vehicles and also daily and recreational human activities. The levels of noise in the project area varies, depending on the season, and/or the time of day, the number and types of sources of noise, and distance from the sources of noise. Noise levels in the project area are primarily from commercial and recreational vessels, and vehicles on Highway 399. Noise levels fluctuate with highest levels usually occurring during the spring and summer months due to the increased boating and coastal beach activities.

Noise-sensitive receptors include sensitive land uses and those individuals and/or wildlife that could be affected by changes in noise sources or levels due to the project. Noise-sensitive land uses in the project area include residences and pier recreationists.

Environmental Consequences

Project area visitors and wildlife may be sensitive to changes in noise sources or levels due to the project. Instances of increased noise are expected during construction of the project. The proposed project would generate construction noise associated with equipment during construction. Construction noise can also be a nuisance to residents living near the pier to project construction activities or to visitors.

Mitigation measures that serve to limit noise during construction include: limiting activity at project sites to daytime hours; limiting truck traffic ingress/egress to the site to daytime hours; promoting awareness that producing prominent discrete tones and periodic noises (e.g., excessive dump truck gate banging) should be avoided as much as possible; and requiring that work crews seek pre-approval for any weekend activities, or activities outside of daytime hours. Because construction noise is temporary, any negative impacts to the human environment during construction activities would be short-term and minor.

Once facilities are constructed, noise can be generated from facility operations and the vehicles associated with these facilities. However, these noise levels would be representative of a pier and similar in nature to those currently generated. Overall, long-term noise impacts from recreationists and recreational activities would be minor.

12.17.5.3 Biological Environment

12.17.5.3.1 Living Coastal and Marine Resources

Affected Resources

Coastal and marine resources at the site include open water habitat in Santa Rosa Sound. Nearby areas are mostly developed along the shoreline. Seagrass is present in the area surrounding the Bob Sikes Pier.

Gulf sturgeon, manatees, sawfish, and sea turtles (Kemp's Ridley, loggerhead, leatherback, and green) may visit the waters of the project location. The project is located in designated Gulf sturgeon critical habitat. Smalltooth sawfish are not likely to be encountered at the project site because their current distribution has contracted to peninsular Florida and, within that area, they can only be found with regularity off the extreme southern portion of the state (NOAA, National Marine Fisheries Service (NMFS) consultation letter, April 2, 2012). In addition, birds addressed through the MBTA and BGEPA

may also be present, at least occasionally, at the Bob Sikes Pier reflecting both the project's location and the recreational angling the pier supports.

Non-native invasive species could alter the existing terrestrial or aquatic ecosystem within, and possible expand out into adjacent areas after the initial introduction. The invasive species threat, once realized, could result in economic damages. Prevention is ecologically responsible and economically sound. Chapter 3 described more about the regulations addressing invasive species, pathways, impacts, and prevention. At this time specific invasive species that may be present on the project site or could be introduced through the project have not yet been identified.

Environmental Consequences

Impacts to living coastal and marine resources are expected to be negligible. Because the proposed project is not anticipated to require any in-water work, or involve the construction of new structures there will be no additional disturbance or modification of existing habitat. Further, because the project area is already used by the public for recreation and fishing and is adjacent to an active bridge-highway that will remain in operation throughout the project, construction activity is anticipated to represent a marginal source of additional disturbance to species already in the area. Potential impacts would also be mitigated by the availability of nearby suitable habitat that mobile species, including birds, manatees, and turtles, could, and presumably would, access for short periods in response to any disturbance related to project implementation activities.

Based on the Trustees'reviews of project materials (Spring 2013) in coordination with representatives from NOAA's Protected Resource Division (PRD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project falls outside of NMFS Endangered Species Act (ESA) jurisdiction, as it does not contain suitable habitat for species managed by NMFS. As a result, the project did not require further ESA evaluation from NOAA.

On January 28, 2014 consultation with USFWS was completed (McClain, 2014). For this, the Trusteesreviewed the species list for Escambia County, Florida[25] and also considered the presence of bald eagles (*Haliaeetus leucocephalus*) and migratory birds. West Indian manatee (*Trichechus manatus*), five species of sea turtles (Green sea turtle (*Chelonia mydas*), Hawksbill sea turtle (*Eretmochelys imbricata*), Kemp's Ridley sea turtle (*Lepidochelys kempii*), Leatherback sea turtle (*Dermochelys coriacea)*, Loggerhead sea turtle (*Caretta caretta*)), and gulf sturgeon (*Acipenser oxyrinchus desotoi*) could be present in waters surrounding the project area. As noted, Gulf sturgeon critical habitat surrounds the project site.

Because all work will be conducted from the terrestrial environment and debris will not be allowed to enter the water, no impacts to West Indian manatee from implementation of the proposed project are anticipated. No other listed, proposed, or candidate species known from Escambia County, Florida are expected to be using terrestrial areas in or near the project site due to a lack of suitable habitat for these species. Therefore the Trusteesmade a no effect determination for all listed, proposed, and candidate species known from Escambia County, Florida (Herod, 2014). No terrestrial critical habitat is

[25] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

designated or proposed in or near the action area; therefore, none will be adversely modified or destroyed.

No bald eagles or migratory birds are known to nest near the project area. However, migratory birds likely use the area for feeding, loafing, or resting. Because the project area is already used by the public for recreation and fishing and is adjacent to an active bridge-highway that will remain in operation throughout the project, construction activity is anticipated to represent a marginal source of additional disturbance to species already in the area. However, precautions during construction will be used to protect any migratory birds that may be feeding, loafing, or resting in or near the project area. Such precautions include minimizing construction noise to the extent practicable, using care to avoid birds when operating machinery or vehicles near birds, and general contractor awareness of bird presence should avoid any take of migratory birds. Therefore, no impacts to bald eagles or migratory birds are anticipated.

Based upon the information presented above, the Trusteeshave determined the proposed project will have no effect to listed, proposed, or candidate species and will not result in adverse modification or destruction of proposed or designated critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service.

Essential Fish Habitat

EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse impacts on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column.

Based on our reviews of project materials (Spring 2013) in coordination with representatives from NOAA's Habitat Conservation Division (HCD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project will not affect EFH because there is no EFH in the project area. As a result, the project did not require further EFH evaluation.

12.17.5.3.2 Socioeconomics and Environmental Justice

Affected Resources

The population of Escambia County was 302,715 in 2012 and accounted for 1.6 percent of the state's total population. In 2013, median household income in Escambia County was $40,917, which was approximately 7 percent lower than median household income in the State of Florida (U.S. Census 2013). Escambia County contains both minority and low-income populations; however, no communities of environmental justice concern are located adjacent to the project area.

Environmental Consequences

Based on the relatively small scale of construction activities it is not anticipated that the proposed project would create jobs nor would it have substantial impacts to the socioeconomic environment as a result of construction. It is likely that there would be direct beneficial impacts to the local economy as a result for increased recreational and tourist activity in response to the project components. These economic benefits would be concentrated to the Park as well as in the service and retail industry

sectors. Beneficial economic impacts would accrue to local recreational supply retailers, restaurants, and hospitality providers. The proposed project would not adversely affect any low income or minority populations. Overall, no adverse impacts would occur to socioeconomics and environmental justice as a result of the proposed project.

12.17.5.3.3 Cultural Resources

Affected Resources

Construction would take place within the existing footprint of the Bob Sikes Pier and it is surrounded by urban development. This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area .

Environmental Consequences

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

12.17.5.3.4 Infrastructure

Affected Resources

The Bob Sikes Pier is an artificial pier that was designed to support recreational activities. There is currently a recreational path at the site and a parking lot accessed by a roadway. Vehicle use (for both transportation and maintenance) constitutes the primary source of energy consumption in the project area. Other energy uses include electricity consumption at recreational facilities and fuel consumption for landscape management (mowers and gas-powered maintenance equipment). The proposed project would not prevent access to any known energy resources in the project vicinity, such as coal, oil, or natural gas. The project would have no such impacts on the availability of these resources.

Environmental Consequences

Based on the nature of proposed improvements there would be no additional public utility requirements, and all waste generated would be disposed of in an off-site landfill.

Improvements to the Bob Sikes Pier would have a long-term beneficial impact to infrastructure from the renovation of the roadway parking area and recreational path to improve safety and traffic flow.

12.17.5.4 Land and Marine Management

Affected Resources

Surrounding land uses includes recreational facilities and parking, with surrounding land uses being considered developed urban areas. The project area is bordered by Highway 399 to the west and Santa Rosa Sound to the east. The proposed project area is currently used for recreational activities.

Environmental Consequences

Improvements to the Bob Sikes Pier is not anticpated to affect land and marine management because the site is already developed for recreational use; project plans would not change the nature of land use or management but would improve the function of the existing site, resulting in no impacts.

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS (Federal Trustees 2013). The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process (Milligan 2014).Aesthetics and Visual Resources

Affected Resources

The general visual character of this region can be described as semi-urban and developed, with the proposed project area and the pier extending into open water on Santa Rosa Sound adjacent to a major roadway (Highway 399). Surrounding areas/development consist primarily of low-density residential interspersed with commercial developments located along major roadways, with some larger areas remaining in agricultural use or as undeveloped open space. There are no designated protected viewsheds or historic resources in the vicinity of either project site.

Environmental Consequences

Temporary impacts to visual resources would result from construction of the proposed project components. Large construction equipment such as backhoes removal would temporarily obstruct the views for visitors and recreational users at the site. These short-term construction-related impacts to visual resources would be minor. Beneficial impacts to viewsheds would occur after improvements to the pier have been made as much of the work is designed to improve the aesthetics of the site.

12.17.5.4.1 Tourism and Recreational Use

The proposed project area is a public facility that provides opportunities for recreation, including use of the recreational path and fishing. Visitation to the pier is currently not monitored.

Environmental Consequences

During the construction period, recreational experience would be impacted from noise and visual disturbances associated with the use of heavy equipment. Access to the site would also be restricted or impacted to some degree during parking and trail enhancements. Improvements to the Bob Sikes Pier would have a moderate positive impact on tourism and recreational use. While these temporary inconveniences would result in minor short term impacts on tourism and recreational use during the construction and rehabilitation activities at the shoreline, over the long term improved access and improved recreational area would result in benefits to tourism and recreational use

12.17.5.4.2 Public Health and Safety and Shoreline Protection

Affected Resources

No hazardous materials currently exist at the project site where the potential for human exposure to natural or man-made hazards does not present a substantial risk. The project area is situated along an area of stable coastline not prone to significant shoreline erosion under normal conditions, and the

recreation facility as a whole is in good condition with respect to public health. Contaminated soils at the project area are not anticipated, if during construction areas of concern are identified appropriate testing and actions would be taken. The project and its construction are not anticipated to generate hazardous waste or the need for disposal of hazardous waste. All waste generated during construction would be disposed of in the appropriate waste or recycling receptacles on-site would be taken off-site and disproved in an approved waste disposal site by the construction contractor. All occupational and safety regulations would be followed to ensure safety of all workers and the public.

Environmental Consequences

No hazardous wastes would be created during restoration construction. All hazardous materials handled during construction including paints, solvents, chemicals and petroleum products would be contained and appropriate barriers would be in place to ensure the protection of adjacent water resources from potential spills and leaks. In the event of a discharge of oil or release of hazardous substances all spills would be reported to the FDEP and all federal and state regulations would be followed during the cleanup. BMPs in accordance with the Occupational Safety and Health Administration (OSHA) and state and local requirements would be incorporated into construction activities to ensure proper handling, storage, transport and disposal of all hazardous materials. While the majority of project work would take place within the existing footprint of the recreational site and no changes to infrastructure or habitat would occur, soil and sediment stabilization measures would be incorporated into project design as needed in areas where the potential for erosion exists in order to protect resources and public health and safety. No adverse impacts to public health and safety are anticipated as a result of project construction. Project improvements including enhanced lighting, upgraded wheelchair access, minor pier and rail modifications, and trail enhancements are designed to improve public safety, resulting in long-term beneficial impacts.

12.17.6 Summary and Next Steps

The proposed Bob Sikes Pier Restoration project would improve access to a fishing pier in the Pensacola area in Escambia County as well as enhancing the quality of the experience for its recreational users. The proposed improvements include renovating parking areas, enhancing bicycle/pedestrian access, and aesthetic improvements to the surrounding area. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would enhance and/or increase recreational fishing and beach use opportunities by improving access to the existing fishing pier and the associated beach access trail. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

12.17.7 References

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2009a Region 4 Recommendations and EPA Responses. Area Designations for 2008 Ground Level Ozone Standards. http://www.epa.gov/ozonedesignations/2008standards/rec/region4R.htm.

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2010 Green Book: Currently Designated Nonattainment Areas for All Criteria Pollutants. http://www.epa.gov/air/oaqps/greenbk/phistory.html.

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12.18 Florida Artificial Reef Creation and Restoration: Project Description

12.18.1 Project Summary

The proposed Florida Artificial Reef Creation and Restoration project involves creating artificial reefs in Escambia, Santa Rosa, Okaloosa, Walton, and Bay Counties. These proposed improvements include emplacing artificial reefs in permitted areas. The total estimated cost for this project is $11,463,587.

12.18.2 Background and Project Description

The Trustees propose to place artificial reefs in permitted areas in Escambia, Santa Rosa, Okaloosa, Walton, and Bay Counties (see Figure 12-31 for the location of the potential artificial reef areas). Florida has a state artificial reef program that was created by the legislature in 1980. The program is described in section 379.249, Florida Statutes, and operates under Chapter 68E-9, Florida Administrative Code, with staff under Florida Fish and Wildlife Conservation Commission's Division of Marine Fisheries Management. Florida's public artificial reefs are generally placed by commercial marine contractors selected through a competitive bid process and subcontracted by the local coastal government permit holder of the reef area where the artificial reef will be constructed.

The objective of the proposed Florida Artificial Reef Creation and Restoration project is to enhance and/or increase recreational fishing opportunities by increasing the number of artificial reefs in state waters. The restoration work proposed includes emplacing artificial reefs units at different depths across the participating counties (Escambia, Santa Rosa, Okaloosa, Walton, and Bay). The reefs will use different approved designs and will be placed in permitted areas for emplacement of artificial reefs.

12.18.3 Evaluation Criteria

This proposed project meets the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and related response actions, the public's access to and enjoyment of the natural resources along Florida's Panhandle was denied or severely restricted. The proposed Florida Artifical Reef Creation and Restoration project is intended to enhance and/or increase recreational fishing opportunities by increasing the number of artificial reefs in state waters. The project would enhance and/or increase opportunities for the public's use and enjoyment of the natural resources, helping to offset adverse impacts to such uses that resulted from the Spill. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

The project is technically feasible and utilizes proven techniques with established methods and documented results and can be implemented with minimal delay. Government agencies have successfully completed projects of similar scope throughout Florida over many years. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Furthermore, the cost estimates are based on similar past projects and therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.18, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.18 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and

installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). This proposed project is not anticipated to negatively affect regional ecological restoration and is therefore not inconsistent with the long-term restoration needs of the State of Florida. See Section 6d of the Framework Agreement.

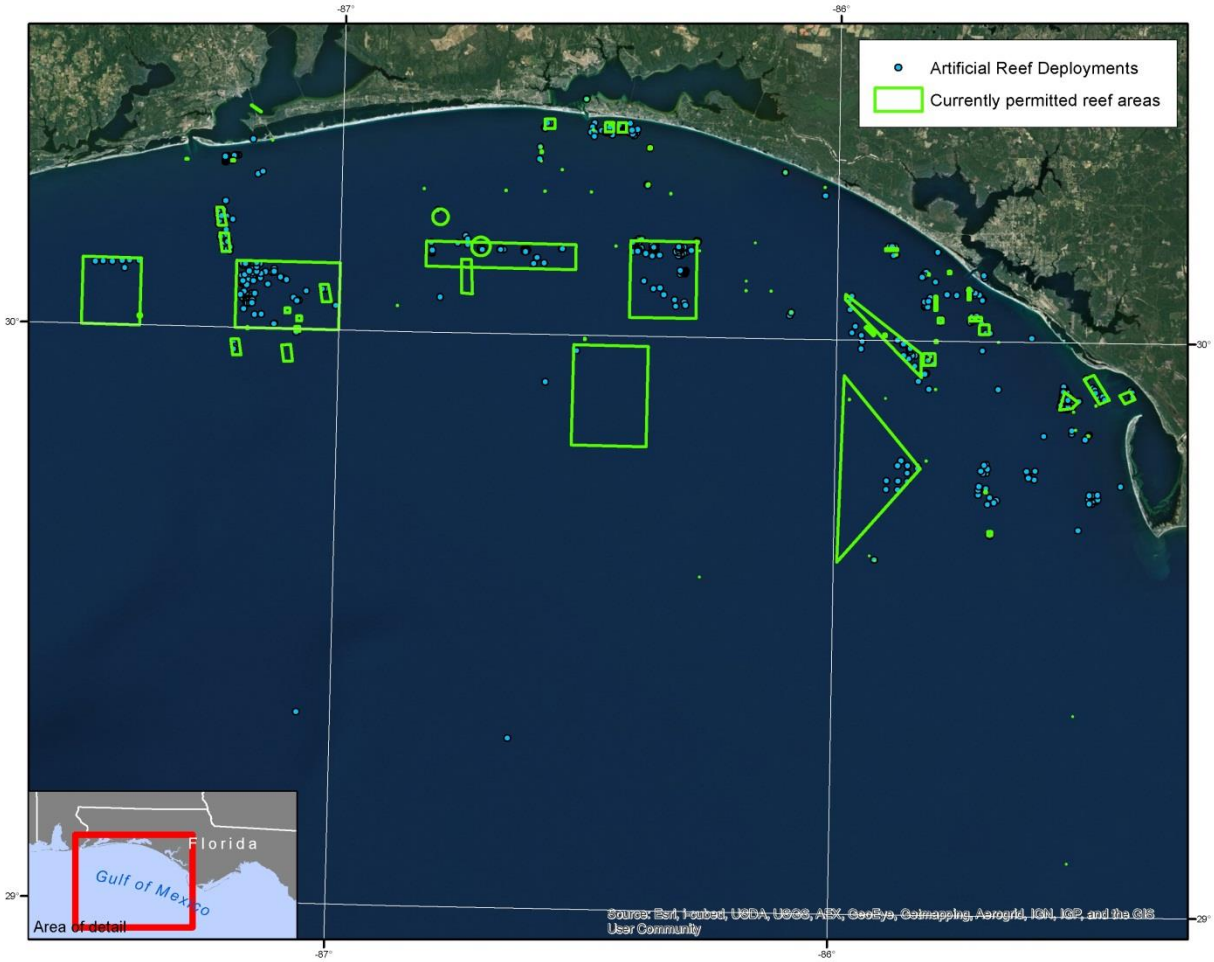

Figure 12-31. Location for potential emplacement of artificial reefs as part of the Florida Artificial Reef Creation and Restoration Project.

Many recreational use projects, including ones similar to this project, have been submitted as restoration projects on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Florida Artificial Reef Creation and Restoration project also meets the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by response and SCAT activities for the Spill.

12.18.4 Performance Criteria, Monitoring and Maintenance

As part of the project cost, both pre-construction and post-construction monitoring will be conducted by the contracted entity (typically a county agency) or their subcontractors to ensure ensure project plans and designs were correctly implemented. Monitoring has been designed around the project goals and objectives. The project objective is enhance and/or increase recreational fishing opportunities by creating artificial reefs in Escambia, Santa Rosa, Okaloosa, Walton, and Bay counties. Specific success criteria include: 1) completion of the construction as designed and permitted, and 2) enhanced and/or

increased access is provided to the natural resources, which will be determined that the reefs are available for public use.

Pre-construction monitoring will primarily be related to siting and determining that there is no hard substrate already present. Post-construction monitoring (typically annually for at least 3 years) is required by permits, and generally includes 1) observations of organisms that populate the structures, and 2) documentation and measurement of physical changes to the reef over time. Additional post-construction monitoring of recreational use will be required by the terms of agreements with the local governments implementing the project and will likely consist of boat or snorkeler diver counts taken at pre-determined intervals for at least 3 years post-construction. The recreational use data will be provided to the Florida Department of Environmental Protection.

12.18.5 Offsets

The Trustees and BP negotiated a BCR of 2.0 for the proposed recreational use project. NRD Offsets are $22,927,174 expressed in present value 2013 dollars to be applied against the monetized value of lost recreational use provided by natural resources injured in Florida, which will be determined by the Trustees' assessment of lost recreational use for the Oil Spill. Please see Chapter 7 of this document (Section 7.2.2) for a description of the methodology used to develop monetized Offsets.[26]

12.18.6 Cost

The total estimated cost to implement this project is $11,463,587. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and contingencies.

[26] For the purposes of applying the NRD Offsets to the calculation of injury after the Trustees' assessment of lost recreational use for the Spill, the Trustees and BP agree as follows:

- The Trustees agree to restate the NRD Offsets in the present value year used in the Trustees' assessment of lost recreational use for the Spill.
- The discount rate and method used to restate the present value of the NRD Offsets will be the same as that used to express the present value of the damages.

12.19 Florida Artificial Reef Creation and Restoration: Environmental Review

The proposed Florida Artificial Reef Creation and Restoration project involves creating artificial reefs in Escambia, Santa Rosa, Okaloosa, Walton, and Bay Counties, in areas permitted for reef construction and restoration. The objective of the proposed Florida Artificial Reef Creation and Restoration project is to enhance and increase the public's use and enjoyment of natural resources by increasing the number of artificial reefs in state waters.

12.19.1 Introduction and Background

In April 2011, the Natural Resource Trustees (Trustees) and BP Exploration and Production, Inc. (BP) entered into the Framework Agreement for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is underway. The Framework Agreement is intended to expedite the start of restoration in the Gulf Coast in advance of the completion of the injury assessment process. Early restoration is not intended to, and does not, fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects would be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement, the Trustees released, after public review of a draft, a Phase I Early Restoration Plan (ERP) in April 2012. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, the National Oceanic and Atmospheric Administration (NOAA) issued a public notice in the *Federal Register* on behalf of the Trustees announcing the development of additional future Early Restoration projects for a Final Phase III ERP/PEIS (ERP). This restoration project was submitted as an Early Restoration project on the NOAA website (NOAA 2013) and submitted to the state of Florida. In addition to meeting the evaluation criteria for the Framework Agreement and the requirements of the Oil Pollution Act (OPA), the project meets Florida criteria that Early Restoration projects occur in the eight-county panhandle area that deployed boom and was impacted by the spill.

The intent of the proposed project is to provide enhanced or additional long-term recreational opportunities through construction and restoration of artificial reefs. In Florida, the state artificial reef program was legislatively created in 1980. The program is described in Section 379.249 of Florida Statutes and operates under Chapter 68E-9 of the Florida Administrative Code (FAC), with staff located as a subsection within Florida Fish and Wildlife Commission's (FWC's) Division of Marine Fisheries Management. Artificial reefs are enjoyed by thousands of visitors and residents of the Florida panhandle each year. Restoring and constructing artificial reefs would be a means to compensate for recreational opportunities that were lost due to the *Deepwater Horizon* Oil Spill. Artificial reefs support a range of human uses, including: snorkeling, recreational fishing, kayaking, and scuba diving, and provide a location where anglers and divers can access aggregated populations of marine species (Adams et al. 2011).

The proposal consists of projects located in five panhandle counties: Escambia, Santa Rosa, Okaloosa, Walton, and Bay Counties, and includes reef designs that would be constructed at various depths. The project would place artificial reef units at multiple locations permitted by the U.S. Army Corps of Engineers (USACE) and the Florida Department of Environmental Protection (FDEP) for artificial reefs.

12.19.2 Project Location

The proposed project area includes coastal waters with permitted areas for emplacement of artificial reefs in Escambia, Santa Rosa, Okaloosa, Walton, and Bay Counties. The project would place artificial reef units at multiple locations permitted by the USACE and the FDEP for artificial reefs: deeper water "nearshore reefs" would be located within 9 nautical miles of shore, in open water**:** shallower "snorkeling reefs" would be less than 20 feet deep and within 950 feet of shore. Figure 12-31 identifies potential placement locations for artificial reef structures.

12.19.3 Construction and Installation

Artificial reefs would be constructed in deepwater habitats of the Gulf of Mexico and in shallower water near the shorelines in the Gulf of Mexico waters off of Escambia, Santa Rosa, Okaloosa, Walton, and Bay Counties, Florida within designated areas permitted by the FDEP and U.S. Army Corps of Engineers. The project would place artificial reef units at multiple locations permitted by the USACE and the FDEP for artificial reefs: deeper water "nearshore reefs" would be located within 9 nautical miles of shore, in open water: shallower "snorkeling reefs" would be less than 20 feet deep and within 950 feet of shore. Figure 12-32 provides an aerial overview of the project area. Figure 12-32 and Table 12-38identify potential placement locations for artificial reef structures.

Construction activities would include placement of linear structures consisting of concrete and stone rubble and pre-fabricated artificial reef modules in permitted areas. These areas are permitted after, among other requirements, completing a bottom survey demonstrating that the location does not have submerged grassbeds, shellfish, other hard bottom communities, or corals within the proposed permit boundaries. Deeper water "nearshore" reefs would likely have a single prefabricated, modular design (see Figure 12-33 for an example of such a design). Shallower "snorkeling" reefs would likely have a layered, piling-mounted design with spacers between the disk shaped layers (see Figure 12-34 for an example).

Figure 12-32. Modular artificial reef unit to be placed in deeper water.

Figure 12-33. Layered artificial reef unit that would be placed in shallower water.

Artificial reefs would be constructed on several sites using a similar process; however, the average water depth and substrate composition of the water bottom at each reef site may differ. A survey would be conducted to determine the placement, alignment, and boundaries of the artificial reefs. All artificial reef installation measures have yet to be finalized, but the following general installation process would likely be used during construction.

Modules would be fabricated and staged at the reef manufacturer's location and then transported to a contractor's staging area. For the pyramid type units shown in Figure 12-32 which have open bottoms, a modification would be made prior to deployment, where necessary, that would effectively remove the top of the pyramid so that there would be a minimum 3 foot opening at the top.

The shallower snorkel reef modules, as shown in Figure 12-33, consist of concrete disks into which are imbedded small limestone rocks of various shapes or in some cases oyster shells may also be imbedded. The purpose of the rock and shells is to increase rugosity and microhabitat. The vertical distance between the disks is controlled by spacers, which are collars slipped over the hollow center pipe. These multi-disk modules are also pre-fabricated and assembled on shore prior to deployment with the number of disks on the pilings varying depending on the water depth and design objective.

At the staging location, the reef modules for each deployment would be loaded onto a deployment vessel equipped with a crane for loading/offloading the prefabricated units. Deployment vessels would travel to the reef locations where boundaries would be marked by the county or their designee using a sub-meter accurate global positioning system.

For the deeper water pyramid type modules, each module would be lifted separately, by crane, from the barge deck using a pelican hook and then lowered to the seafloor where the hook would be disengaged, modules will not be indiscriminately dumped. Modules would be deployed on either side of the vessel in a specific order and adjusted so each successive placement would be far enough from the previous one to prevent any two modules from touching. Figure 12-34 shows such a module being deployed in Escambia County

Figure 12-34. Example of a pyramid type reef being deployed.

For the shallower water disk-type reef modules, typical deployment is slightly different. For these, each reef module is deployed from a tripod which is set in place adjacent to a barge which is in a fixed position. The top of the fully constructed disk reef with central piling is suspended by a hydraulic collar. Once the hollow center pipe is placed in position in contact with the sea floor, ambient saltwater is pumped through the center of the hollow pipe and the pipe subsides to the appropriate depth in the sand layer. The pump is then turned off, the positioning of the disk reef is double checked, the piling is held in place by the tripod for a few minutes until the medium-coarse grained sand re-consolidates around the piling, the hydraulic collar and tripod are then removed and the next disk module is similarly deployed. As a note, these disk modules have also been deployed in deeper water (50 ft. or greater) without pilings but with a large diameter concrete disk base plate below the lowest disk to provide some additional ballast. Figure 12-35 and Figure 12-36 show a disk-type reef unit being lowered in its tripod and being placed with sea water being pumped through the central pipe respectively.

Figure 12-35. Example of a disk-type reef being deployed while still in its supporting tripod.

Figure 12-36. Example of a disk-type reef being placed with seawater being pumped through its central pipe

Artificial reefs in the different locations would be constructed on several sites using a similar process; however, the average water depth and substrate composition of the water bottom at each reef site may differ. A survey would be conducted to determine the placement, alignment, and boundaries of the artificial reefs. The final engineering and design process would determine material needs for intertidal reef construction. If alternative materials are proposed, their suitability would first be evaluated against criteria in existing guidelines for reef materials (Atlantic and Gulf States Marine Fisheries Commissions, 2004). Equipment would be selected considering its draft and considering the specific project location. This would help avoid/minimize the risk of prop dredging or blowouts or impacts from grounding in shallow water locations. These concerns would not be present with the deeper water locations. The maximum allowable material height varies within and between sites based on ambient depth gradients and navigational clearances in the location, which are determined by the U.S. Coast Guard and referenced in their nautical charts.

Standard best management practices (BMPs) would be followed for emplacing artificial reef units. This includes adhering to the *2006 Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006) and *Standard Manatee Conditions for In-Water Work* (USFWS, 2011) that rely on boat/barge speed controls and use of observers to help minimize the risk of adverse impacts to manatees during transport and placement activities. Some temporary shading from workboats during construction periods may

occur, but the degree of shading is unknown at this time because it would be a function of the number and type of equipment (e.g., barges, workboats) used at the time of emplacement. Seagrass generally is not present in the project areas; however, access over existing seagrass would be avoided to the extent practicable to minimize prop-scarring impacts. Efforts to reduce turbidity in the shallow water emplacement areas consistent with existing best practice guidelines would be followed. Turbidity associated with the placement of these units is generally minimal and dissipates quickly based on observations from individuals who have observed deployments.

Table 12-38 provides a summary of the proposed potential maximum reef unit deployment activities that could be undertaken in the various counties along with information on the type and number of reefs and the location of the reef placement areas.

Table 12-38. Summary of maximum potential reef deployment activity by county.

County	Permit Area Name	Permit Area Dimesions	Center Latitude	Center Longitude	# of tetrahedron modules	# of disc modules	Total Module footprint (All modules combined)	Depth (feet)	Distance center point is from shore
Escambia	Nearshore East	1 nm x 2 nm	30°17.673' N	87°13.153'W	333	0.0	14,419	45'-60'	1.52 nm
Escambia	Nearshore West	1 nm x 2 nm	30°15.563' N	87°20.702'W	333	0.0	14,419	35'-50'	3.19 nm
Escambia	Casino	.25 nm x .25 nm	30°18.721' N	87°07.324'W	333	0.0	14,419	50'-60'	1.30 nm
Escambia	South East Site	1.7 nm x 6 nm	30°11.257' N	87°09.008'W	334	0.0	14,462	85'-100'	8.27 nm
TOTAL FOR ESCAMBIA COUNTY					**1,333**	**0.0**	**57,719**		
Santa Rosa	SR-26 Reef Site- Gulf Snorkle Reef	246'x270'	30° 22.734'N	86° 51.224'W	0	60.0	960	12'-14'	.10 nm
Santa Rosa	SR-27 Reef Site -Nearshore Reef	1 nm x 2 nm	30°21.168'N	86°51.665'W	703	0.0	30,440	55'-70'	1.57 nm
TOTAL FOR SANTA ROSA COUNTY					**703**	**60**	**31,400**		
Okaloosa	FH-13 Reef Site	1320' x 1320'	30° 21.391'N	86° 32.876'W	200	0	8,660	69'	1.40 nm
Okaloosa	FH-14 Reef Site	1320' x 1320'	30° 21.141'N	86° 36.874'W	200	0	8,660	69'	2.59 nm
Okaloosa	Crystal Beach Snorkel Site	200' x 500'	30° 22.818'N	86° 26.100'W	0	52.0	832	9'-17'	.10 nm
Okaloosa	FH-15 Reef Site	1320' x 1320'	30° 21.891'N	86°42.374' W	200	0	8,660	70'	1.80 nm
Okaloosa	FH-16 Reef Site	1320' x 1320'	30° 20.891'N,	86°42.374'W	200	0	8,660	70'	2.40 nm
Okaloosa	Okaloosa Island Snorkel Site	200' x 500'	30° 23.694'N,	86° 37.012'W	0	52.0	832	9'-17'	.10 nm
TOTAL FOR OKALOOSA COUNTY					**800**	**104**	**36,304**		
Walton	Miramar Beach Snorkel Reef	225' x 900'	30° 22.565' N	86° 23.320 W	0	64	1,024	14-20'	.10 nm
Walton	Topsail Hill Snorkel Reef	280' x 900'	30° 21.393' N	86° 16.661 W	0	64	1,024	14-19'	.10 nm
Walton	Grayton Beach Snorkel Reef	200' x 900'	30° 19.359' N	86° 09.471 W	0	58	928	13-18'	.10 nm
Walton	Inlet Beach Snorkel Reef	200' x 800'	30° 16.237' N	86° 00.348 W	0	75	1,200	15-21'	.10 nm
Walton	Miramar Beach Fish/Dive Reef	1,519' x 1,519'	30° 21.875' N	86° 23.356' W	60	0	2,598	59-61'	0.64 nm
Walton	Topsail Bluff Fish/Dive Reef	1,519' x 1,519'	30° 21.375' N	86° 19.356' W	60	0	2,598	59-64'	.52 nm
Walton	Fort Panic Fish/Dive Reef	1,519' x 1,519'	30° 20.375' N	86° 15.356' W	60	0	2,598	58-63'	.61 nm
Walton	Ed Walline Fish/Dive Reef	1,519' x 1,519'	30° 19.975' N	86° 13.856' W	60	0	2,598	55-58'	.59 nm
Walton	Blue Mountain Fish/Dive Reef	1,519' x 1,519'	30° 19.375' N	86° 12.056' W	60	0	2,598	52-54'	.67 nm
Walton	Grayton Beach Fish/Dive Reef	1,519' x 1,519'	30° 18.672' N	86° 09.656' W	60	0	2,598	56-59'	.66 nm
Walton	Santa Clara Fish/Dive Reef	1,519' x 1,519'	30° 18.075' N	86° 07.356' W	60	0	2,598	52-56'	.56 nm
Walton	Deer Lake Fish/Dive Reef	1,519' x 1,519'	30° 17.375' N	86° 04.856' W	60	0	2,598	50-57'	.44 nm
Walton	Inlet Beach Fish/Dive Reef	1,519' x 1,519'	30° 15.675' N	86° 00.856' W	60	0	2,598	54-57'	.67 nm
Walton	Miramar Reef Site	1,519' x 1,519'	30° 19.700' N	86° 22.900' W	100	0	4,330	77-83'	2.85 nm
Walton	Fish Haven #1	1,320' x 1,320'	30° 19.327' N	86° 17.875' W	60	0	2,598	70'	2.4 nm
Walton	Fish Haven #2	1,320' x 1,320'	30° 16.109' N	86° 13.875' W	60	0	2,598	80'	4.4 nm
TOTAL FOR WALTON COUNTY					**760**	**261**	**37,084**		
Bay	SAARS C	1,519' x 1,519'	30° 08.590'N	85° 51.825'W	63	0	2,728	63'	3.25 nm
Bay	SAARS D	1,519' x 1,519'	30° 10.191'N	85° 54.624'W	63	0	2,728	69'	3.16 nm
Bay	Bell Shoals	1 nm x 3 nm	29° 55.090'N	85° 28.279'W	678	0	29,357	15-30'	2.27 nm
Bay	SAARS E	1,519' x 1,519'	30° 08.963'N	85° 53.770'W	63	0	2,728	64'	3.87 nm
Bay	SAARS F	1,519' x 1,519'	30° 09.434'N	85° 49.863'W	63	0	2,728	60'	1.58 nm
Bay	SAARS G	1,519' x 1,519'	30° 07.327'N	85° 50.832'W	63	0	2,728	64'	3.74 nm
Bay	SAARS H	1,519' x 1,519'	30° 00.128'N	85° 41.720'W	63	0	2,728	75'	4.95 nm
Bay	SAARS I	1,519' x 1,519'	30° 01.268'N	85° 39.794'W	63	0	2,728	69'	3.18 nm
Bay	Snorkel Reef		30° 13.572'N	85° 54.455'W	N/A	33.0	528	15'	.10 nm
TOTAL FOR BAY COUNTY					**1,119**	**33**	**48,981**		
	TOTAL FOR ALL COUNTIES				**4,715**	**458**	**211,488**		

12.19.4 Operations and Maintenance

12.19.4.1 Anticipated Pre- and Post-project Monitoring Activities

Monitoring activities would be performed at various times, beginning before construction and continuing after construction. Monitoring would ensure project designs are correctly implemented during construction and in a subsequent period, defined by contract, where corrective actions could be taken. Monitoring activities would include the following:

- Topographic/bathymetric surveys
- Public use monitoring

Pre-restoration deployment would be conducted to confirm that no hard substrate is already present in areas where artificial reef structures would be placed.

Construction-related monitoring would consist of having divers observe the placement of the modules and record exact coordinates of placed materials so that existing state databases can be updated.

Post-construction monitoring would be conducted to evaluate the project's performance over time with respect to the agreed-upon Offsets, goals, and objectives. In general, monitoring would evaluate the production and support of organisms on the living shoreline structure (e.g., secondary production), document and measure physical changes to the reef over time, and possibly provide observations of public use. Components of this monitoring would include collecting information with respect to reef height and structural integrity, water quality parameters (e.g., salinity, dissolved oxygen), bivalve and algal presence, coverage, and composition on the reef.

12.19.4.2 Anticipated Short-term Maintenance Activities

In accordance with the USACE permitting process, fathometer scans would be conducted once per year for all artificial reef sites to verify material location and condition. Yearly monitoring would also include the use of SCUBA to conduct Level 1, 2, 4, and 4a monitoring. Definitions of each monitoring level are provided in the USACE permit.

12.19.4.3 Anticipated Long-term Maintenance Activities

Over the long term, project sites would be incorporated into FWC's ongoing diver-based artificial reef monitoring survey program, which evaluates the status of emplaced reef modules. In addition, some counties (e.g., Escambia) also have their own independent reef monitoring programs. Once placed, artificial reef units would require little or no maintenance. Over a period of years to decades, the artificial reef structures would degrade gradually or may be covered through a combination of subsidence and sediment transport/accumulation.

12.19.5 Affected Environment and Environmental Consequences

Under the National Environmental Policy Act, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

12.19.5.1 No action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

Under No Action, the existing conditions described for the project site in the affected environment subsection would prevail. Restoration benefits associated with this project would not be achieved at this time.

12.19.5.2 Physical Environment

12.19.5.2.1 Geology and Substrates

Affected Resources

The existing geology and substrates in the project area for artificial reef installation is generally flat or gently sloping. The five counties where restoration is planned are part of the Gulf of Mexico formation.

Sediments

Sediments in the area have been sculptured from alluvial plain underlain by sand, gravel, silt, and clay. The soil surveys for the various counties identify the areas for reef deployment as "waters of the Gulf of Mexico," and no soils data are provided (NRCS 2013).

Environmental Consequences

As a result of the emplacement, there may be a minor, short-term impact to the geology and substrates associated with the conversion of relatively small areas of similar sandy habitat to areas with hard substrate. There would be no impact over the long term as materials degrade and/or subside or are covered by sand and other sediment. The project would have no net negative impact on geology and substrates.

12.19.5.2.2 Hydrology and Water Quality

Affected Resources

Artificial reef installation would take place in nearshore, open-water habitats and shallower waters closer to shores in the waters of five counties in the panhandle of Florida. Existing hydrology and water quality are affected by shoreline development and management, as well as boat traffic in the bays and Gulf of Mexico.

Water Quality

The CWA requires that the surface waters of each state be classified according to designated uses. Florida has six classes with associated designated uses, which are arranged in order of degree of protection required. According to 62-302.400, Fla. Admin. Code, most of the project occurs within Class III waters. Therefore, standards to meet the following uses apply to the project area: fish consumption, recreation, and propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The surface waters of the state are designated Class III unless otherwise described in Florida rule. Short-term water quality impacts are possible due to sediment disturbance during artificial reef installation at project sites.

Outstanding Florida Waters and Aquatic Preserves
There are no waters that are designated as Outstanding Florida Waters (OFW), wild and scenic rivers, or aquatic preserves located in or immediately adjacent to the project area (FDEP 2013).

In Florida, state aquatic preserves are generally listed as OFWs. Apalachicola Bay, Fort Pickens, St. Joseph Bay, and St. Andrews Aquatic Preserves are located in the general area of several of the proposed shallower snorkeling artificial reef locations. Waters in aquatic preserves and state parks, as OFWs, require additional water quality considerations; the FWC would be consulted to determine any concerns due to proposed project activities. These OFWs are significant distances upstream of the proposed sites and not likely to be affected by the proposed projects. Very short-term impacts, such as increased turbidity, due to reef module placement are possible but pose no long-term threat to water quality. Over time, the accumulation of filter feeding organisms on the reefs, such as oysters, may improve local water quality.

Wetlands
The project is located in open water, and no wetlands are known to be in the project area. Land-based storage areas for artificial reef material would be placed outside of wetland areas (USFWS 2013b).

Environmental Consequences
Artificial reef installation would have no long-term, adverse impact on hydrology and water quality. Some construction would be completed at existing artificial reef locations so no water bottom impacts are expected as reef modules would be placed on natural or artificial materials. There may be short-term impacts during the approximately 1-year period of construction including increased sediment disturbance and turbidity during reef module placement. All required permits would be obtained, and conditions, permit requirements, and best management practices (BMPs) would be followed during construction.

The placement of artificial reef modules would result in short-term, minor, temporary impacts to water quality, specifically short-term elevations in turbidity. BMPs, along with other avoidance and mitigation measures required by state and federal regulatory agencies, would be employed to minimize any water quality and sedimentation impacts. Authoriztion pursuant to Rivers and Harbors Act Section 10 and Clean Water Act Section 404, and Clean Water Act 401 water quality certification would be required and all permit conditions would be adhered to.

The proposed discharge of dredged or fill material into waters of the United States, including wetlands, or work affecting navigable waters associated with this project is currently being coordinated with the U.S. Army Corps of Engineers (USACE) pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). The required USACE and state permits for designated artificial reef areas associated with this project are in different stages depending on the county. However, coordination with the USACE and final authorization pursuant to CWA/RHA will be completed prior to project implementation.

12.19.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources
The Clean Air Act (CAA) requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment.

NAAQS have been set for six common air pollutants (also known as criteria pollutants)—particle pollution or particulate matter, ozone, carbon monoxide, sulfur dioxide (SO_2), nitrogen dioxide, and lead. Particulate matter is defined as fine particulates with a diameter of 10 micrometers or less (PM_{10}) and fine particulates with a diameter of 2.5 micrometers or less ($PM_{2.5}$). When a designated air quality area or airshed in a state exceeds a NAAQS, that area may be designated as a "nonattainment" area. Areas with levels of pollutants below the health-based standard are designated as "attainment" areas. To determine whether an area meets the NAAQS, air monitoring networks have been established and are used to measure ambient air quality. The EPA also regulates 187 hazardous air pollutants (HAPs) that are known or suspected to cause cancer or other serious health impacts. Air quality in the Florida panhandle is in attainment with the NAAQs (EPA 2013a).

Greenhouse Gases

Gases that trap heat in the air are called greenhouse gases (GHGs). The primary GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_x), and fluorinated gases. Over the past century, human activities have released large amounts of GHGs into the atmosphere, which are contributing to global warming. Global warming is defined as the ongoing rise in global average temperature near the Earth's surface and is known to cause changes in climate patterns.

According to the EPA, the average annual temperature in the southeast portion of the United States has increased by approximately 2.0°F (degrees Fahrenheit) since 1970. Winters, in particular, are getting warmer, and the average number of freezing days has decreased by 4 to 7 days per year since the mid-1970s. Most areas are getting wetter; autumn precipitation has increased by 30% since 1901 (EPA 2013b). In many parts of the region, the number of heavy downpours has increased. Despite the increases in fall precipitation, the area affected by moderate and severe drought has increased since the mid-1970s (EPA 2013b).

Average annual temperatures in the region are projected to increase from 4°F to 9°F by 2080. Hurricane-related rainfall is projected to continue to increase. Models suggest that rainfall would arrive in heavier downpours, with increased dry periods between storms. These changes would increase the risk of both flooding and drought. The coasts would likely experience stronger hurricanes and sea level rise. Storm surge could present problems for coastal communities and ecosystems (EPA 2013b).

Total GHG emissions in the state of Florida from 1990 to 2007 have increased at an average rate of 2.1% per year. Total GHG emissions in 2007 were 290 million metric tons of CO_2 equivalent ($MMTCO_2E$). In 2007, 91% of GHG emissions in Florida were CO_2 emissions (FDEP 2010).

Environmental Consequences

Project implementation would require the use of heavy mechanized equipment, which would lead to temporary air pollution (e.g., criteria pollutants, HAPs, GHGs) due to emissions from the operation of construction vehicles and equipment. Any air quality impacts that occur would be minor due to their localized nature, short-term duration, and the small size of the project. Available BMPs would be employed to prevent, mitigate, and control potential air pollutants during project implementation. No air quality–related permits would be required. The project areas are currently in attainment with NAAQS parameters. The proposed action would not affect the attainment status of the project areas or region. A State Implementation Plan conformity determination (42 USC 7506 (c)) is not required since the project areas are in attainment for all criteria pollutants.

Project plans have not been finalized for this project. As such, it is unclear what equipment would be used and the duration of use for that equipment. The following table provides GHG emissions estimates for a variety of construction and transportation equipment that may be used for the placement of reefs. Each of these emissions is based on use of the heavy equipment over an 8-hour day (Table 12-39).

Table 12-39. Greenhouse gas emissions for mechanized equipment likely to be used.

EQUIPMENT DESCRIPTION[1]	TOTAL HOURS USED	CO_2 (METRIC TONS)[2]	CH_4 (CO_2E) (METRIC TONS)[3]	NO_X (CO_2E) (METRIC TONS)	TOTAL CO_2E (METRIC TONS)
Dump Trucks/ Flatbed Trucks[4,5]	360	6.12	1.8	25.92	33.84
Crane (bare and with clamshell attachment)	720	18.36	6.12	73.44	97.92
Tug Boat (8 trips)	720	468	144	1872	2484
Total	**5,040**				**7813.44**

[1] Emissions assumptions for all equipment based on 8 hours of operation.
[2] CO_2 emissions assumptions for diesel and gasoline engines based on EPA (2009).
[3] CH_4 and NO_x emissions assumptions and CO_2e calculations based on EPA (2011).
[4] Construction equipment emission factors based on EPA nonroad emission factors for 250-horsepower pieces of equipment. Data were accessed through the California Environmental Quality Act Roadway Construction Emissions Model.
[5] Emissions assumptions are for an 8-cylinder, 6.2-liter gasoline engine Ford F150 pickup and 18 gallon (half-tank) daily fuel consumption (U.S. Department of Energy 2013).

Based on the assumptions described in Table 12-39 above, GHG emissions would not exceed 25,000 metric tons per year. Given the projected construction-phase GHG emissions, the small scale and short duration of the project, and increased project area use, predicted impacts on air quality from GHG emissions would be anticipated to be minor in both the short term and the long term.

Boat use could increase due to subsequent monitoring requirements of the artificial reef expansion/restoration, but monitoring would likely only require a single boat several times a year. This boat use would likely increase exhaust emissions and could affect air quality, but it would occur over a short time period and would be temporary, so adverse impacts to air quality would be expected to be minor because management actions could be taken to limit boat use.

12.19.5.2.4 Noise

Affected Resources

Noise can be defined as unwanted sound and noise levels, and its effects are interpreted in relation to effects on nearby visitors to the recreational areas and wildlife in the project vicinity. The Noise Control Act of 1972 (42 USC 4901–4918) was enacted to establish noise control standards and to regulate noise emissions from commercial products such as transportation and construction equipment. The standard measurement unit of noise is the decibel (dB), which represents the acoustical energy present. Noise levels are measured in A-weighted decibels (dBA), a logarithmic scale that approaches the sensitivity of the human ear across the frequency spectrum. A 3-dB increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear. Table 12-40 shows typical noise levels for common sources expressed in dBA. Noise exposure depends on how much time an individual spends in different locations.

Table 12-40. Common noise levels.

NOISE SOURCE OR EFFECT	SOUND LEVEL (DBA)
Rock-and-roll band	110
Truck at 50 feet	80
Gas lawnmower at 100 feet	70
Normal conversation indoors	60
Moderate rainfall on foliage	50
Refrigerator	40
Bedroom at night	25

Source: Adapted from U.S. Department of Energy and Bonneville Power Administration (1986).

Noise levels in the project area vary depending on the season, time of day, number and types of noise sources, and distance from noise sources. Existing sources of noise in the project area are mainly from recreational boating or commercial traffic. Ambient natural sounds such as wind, waves, and wildlife also contribute to existing noise levels. Existing ambient noise levels in the project area are generally low and predominantly result from daily boating activities.

Artificial reef installation would take place in deeper, Gulf of Mexico open-water habitats and shallower, nearshore areas in the Florida panhandle. Noise-sensitive receptors include sensitive land uses and those individuals and/or wildlife that could be affected by changes in noise sources or levels due to the proposed project. Noise-sensitive receptors in the project vicinities include beach recreational use and wildlife. Existing noise conditions are affected by boat traffic in the Gulf of Mexico and may be somewhat impacted from industrial, commercial, or other human activities both in the Gulf of Mexico and in nearby shoreline areas.

Environmental Consequences

Artificial reef creation would have a minimal, short-term impact on noise. There would be a temporary increase in noise caused by barge engines while reef material is placed. In the short term, barges and machinery and equipment used during artificial reef creation would generate noise, which may disturb wildlife and humans using the area but would be kept to a minimum using BMPs (e.g., state requirement to use appropriately muffled equipment). Long-term, minor noise impacts may result from any increase in motor boat access to the emplacement areas.

12.19.5.3 Biological Environment

12.19.5.3.1 Living Coastal and Marine Resources

Marine and Estuarine Resources (benthic organisms, oysters, fish)

Affected Resources

There are a number of aquatic species found in the project area. More than 200 species of fish and shellfish have been reported in the open and estuarine waters of the northern Gulf of Mexico, specifically the Pensacola and Apalachicola Bay systems. Four anadromous fish are known to inhabit the

river systems: Gulf sturgeon (*Acipenser oxyrhynchus desotoi*), Alabama shad (*Alosa alabamae*), skipjack herring (*Alosa chrysochloris*), and striped bass (*Morone saxatilis*). Other species native to the area include spot (*Leiostomus xanthurus*), bay anchovy (*Anchoa mitchilli*), Atlantic croaker (*Micropogonias undulatus*), spotted seatrout (*Cynoscion nebulosus*), , Gulf menhaden (*Brevoortia patronus*), , striped mullet (*Mugil cephalus*), American eel (*Anguilla rostrata*), chain pickerel (*Esox niger*), , coastal shiner (*N. petersoni*), silver perch (*Bairdiella chrysura*), clown goby (*Microgobius gulosus*), darter goby (*Gobionellus boleosoma*), blue crab (*Callinectes sapidus*), ghost crab (*Ocypode quadrata*), American oyster (*Crassotrea virginica*), and Penaeid shrimp (*Penaeus* spp.). The dominant epibenthic macroinvertebrates include brown shrimp (*Penaeus aztecus*) and blue crabs (Livingston 1999). Benthic organisms include bivalves, gastropods and other mollusks, anemones, amphipods, annelids, crustaceans, and echinoderms, and are also abundant in these waters.

Environmental Consequences

The proposed project would likely result in short-term, minor adverse impacts to fish that may be present during the in-water construction as a result of turbidity and noise disturbance during construction of the artificial reefs. Benthic organisms present in the substrate may also be adversely affected during reef construction. However, the proposed project is intended to increase available reef habitat by providing appropriate habitat for species that inhabit reef ecosystems, as well as surface for attachment of sessile organisms, so reef construction impacts would be short term and minor and in the long term would benefit the ecosystem around the artificial reef.

12.19.5.4 Wildlife

Affected Resources

The project is in open-water estuarine/marine habitats. No impacts to general terrestrial wildlife species are anticipated. Marine wildlife are discussed below in a different section.

Environmental Consequences

No impacts to terrestrial wildlife species are anticipated. Marine wildlife are discussed below in different section.

12.19.5.5 Protected Species

Affected Resources

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

The federally listed threatened and endangered species that may occur in or near the project area in Escambia, Santa Rosa, Okaloosa, Walton and Bay Counties include five species of sea turtles, West Indian manatee (*Trichechus manatus latirostris*), piping plover (*Charadrius melodus*), and Gulf sturgeon, and one proposed species, red knot (*Calidris canutus rufa*) (USFWS 2013c). State-listed threatened species reported to occur in the project area are addressed below, under State-Listed Species.

The Trustees have reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS. For this, the Trustees first reviewed the species list for Escambia, Santa Rosa, Okaloosa, Walton and Bay Counties, Florida[27]. Table 12-41 presents a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

Table 12-41. Potential Impacts to Species/Critical Habitats managed by USFWS

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle[a], Hawksbill turtle[a], Kemp's ridley turtle; Leatherback turtle[a], Loggerhead turtle	No work will occur in the terrestrial environment; therefore no impacts will occur to sea turtle species in the terrestrial environment. Consultation has been initiated with NMFS, as this is the agency that has jurisdiction to review impacts to sea turtles in the estuarine and marine environments. The main risk to sea turtles during execution of this project would come from boat collisions which could result in harm or mortality. Critical habitat for the green sea turtle has been designated for the waters surrounding Culebra Island, Puerto Rico, and its outlying keys (63 FR 46693). Marine and terrestrial critical habitat for the leatherback sea turtle has been designated at Sandy Point on the western end of the island of St. Croix, U.S. Virgin Islands (44 FR 17710) and critical habitat will be reassessed during the future planned status review (76 FR 47133). Critical habitat for the hawksbill sea turtle has been designated for selected beaches and/or waters of Mona, Monito, Culebrita, and Culebra Islands, Puerto Rico (63 FR 46693). No designated critical habitat for the green, leatherback, or hawksbill sea turtles occurs within the action area. No critical habitat has been designated for the Kemp's ridley sea turtle; therefore, none will be adversely affected or modified. The project area does not overlap with the currently proposed critical habitat areas in Florida for Northwest Atlantic Distinct Population Segment of the loggerhead sea turtle as these habitats are terrestrial (i.e., beaches and shorelines) (78 FR 18000) Department of the Interior, 2013). Though it is nearby, the proposed project will not result in any changes to shoreline habitats, and no impacts to proposed critical habitat will occur.
West Indian manatee	The counties in the project area are not part of the 36 Florida counties that are identified as being counties where manatees regularly occur in coastal and inland waters (U.S. Department of the Interior, 2011). However, manatees could be present in the project waters, though most, if not all, of the proposed reef sites are in deeper waters than manatees could use during transit. The sites for reefs do not support sea grasses for foraging. The main risk to manatees during implementation of this project would come from boat collisions which could result in harm or mortality. Once constructed, artificial reefs would not block or impede any transitory routes used by manatees. Noise, use of vessels, and human presence during recreational use of the artificial reefs could harass manatees, if present. With the minimization recommendations, the Trusteesdo not expect noise, the use of vessels, and increased human presence either during construction or after implementation to result in any behavioral changes (i.e., feeding, breeding, or sheltering) to any manatee transiting the area.

[27] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Piping plover	The main risk to Piping plovers is from human disturbance while resting, foraging in habitats adjacent to marine work areas. The proposed project could result in short term increases in noise which could startle individuals. Though the Trusteeswould expect normal activity to resume within minutes or cause the plovers to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. No indirect impacts are expected. The project will not result in any changes to shoreline habitat; therefore any critical habitat nearby will not be affected.
Red knot	The main risk to red knot is from human disturbance while resting, foraging in habitats adjacent to marine work areas. The proposed project could result in short term increases in noise which could startle individuals. Though the Trusteeswould expect normal activity to resume within minutes or cause the red knots to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The proposed project may result in increased visitors to the reefs with some beach use. The Trusteesdo not expect the level of visitors to increase so much that normal behaviors would be interrupted. Therefore, no indirect impacts are expected.
Gulf sturgeon	NMFS was consulted on Gulf sturgeon and its Critical Habitat in the estuarine environment. As a result, Gulf Sturgeon was not considered in the consultation with the USFWS.

In addition to the protected species managed by USFWS, the Trusteesreviewed the proposed projects and associated actions for potential impacts to the following protected species (status indicated) and their associated critical habitat, if appropriate, managed by NMFS:

- Gulf Sturgeon, *Acipenser oxyrinchus desotoi*, Threatened
- Smalltooth Sawfish, *Pristis pectinata,* Endangered
- Green Sea Turtle, *Chelonia mydas*, Endangered
- Loggerhead Sea Turtle, *Caretta caretta*, Threatened
- Hawksbill Sea Turtle, *Eretmochelys imbricata*, Endangered
- Leatherback Sea Turtle, *Dermochelys coriacea*, Endangered
- Kemp's Ridley Sea Turtle, *Lepidochelys kempii*, Endangered.

Additional information for some of these species is provided below.

Sea Turtles and Marine Mammals

There are five species of endangered or threatened sea turtles that may occur or have potential to occur in the project area. These are the green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), Kemp's ridley turtle (*Lepidochelys kempii*), leatherback turtle (*Dermochelys coriacea*), and loggerhead turtle (*Caretta caretta*). Sea turtles forage in the waters of the coastal Florida panhandle region and nest on the beaches. Critical habitat has been proposed for the Loggerhead on beaches adjacent to in-water work areas. PCE's include: 1) Suitable nesting beach habitat that: (a) has relatively unimpeded nearshore access from the ocean to the beach for nesting females and from the beach to the ocean for both post-nesting females and hatchlings and (b) is located above mean high water to avoid being inundated frequently by high tides. 2) Sand that: (a) allows for suitable nest construction, (b) is suitable for facilitating gas diffusion conducive to embryo development, and (c) is able to develop

and maintain temperatures and moisture content conducive to embryo development. 3) Suitable nesting beach habitat with sufficient darkness to ensure that nesting turtles are not deterred from emerging onto the beach and hatchlings and post-nesting females orient to the sea.

The endangered West Indian manatee has the potential to occur in project area waters. Manatees typically seek out shallow seagrass areas as preferred feeding habitat (FWC 2007). Additionally, bottlenose dolphins (*Tursiops* spp.) populations are known to migrate into bays, estuaries, and river mouths and could be located in the proposed project area (NMFS 2013a). Bottlenose dolphins have been observed entering and leaving Choctawhatchee Bay and on nearshore coastal waters (NMFS 2012).

Smalltooth Sawfish, Gulf Sturgeon, and Gulf Sturgeon Critical Habitat

Smalltooth sawfish (*Pristis pectinata*) do not typically use northern Gulf of Mexico waters (NMFS 2013b). Gulf sturgeon are restricted to the Gulf of Mexico and its drainages, occurring primarily from thePearl River, Louisiana to the Suwannee River, in Florida (NMFS 2009). Adult fish reside in rivers for 8 to 9 months each year and in estuarine or Gulf of Mexico waters during the 3 to 4 cooler months of each year (NMFS 2009). Important marine habitats include seagrass beds with sand and mud substrates (Mason and Clugston 1993).

Gulf sturgeon critical habitat was jointly designated by the NMFS and the USFWS on April 18, 2003 (50 Code of Federal Regulations [C.F.R.] 226.214). The proposed project site is located within the Florida Nearshore Gulf of Mexico Critical Habitat Unit 10, which contains winter feeding and migration habitat for Gulf sturgeon. Critical habitat was designated based on seven primary constituent elements (PCEs) essential for the species' conservation, as defined in the 2003 *Federal Register* and are listed below. PCE's 1, 5, 6, and 7 are present in the project area.

1. Abundant food items, such as detritus, aquatic insects, worms, and/or mollusks, within riverine habitats for larval and juvenile life stages, and abundant prey items, such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks, and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages;
2. Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
3. Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths; these are believed necessary for minimizing energy expenditure during freshwater residency and possibly for osmoregulatory functions;
4. A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging;
5. Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages;
6. Sediment quality, including texture and chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and

7. Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., an unobstructed river or a dammed river that still allows for passage).

Piping Plover

The sandy beaches and shorelines adjacent to some of the project area offer suitable foraging and resting habitat for the piping plover during the winter migratory season, and piping plover may forage in the shallow waters of the project area. Natural shorelines in the proposed project vicinity provide suitable winter migration resting habitat for the piping plover. Piping plover wintering habitat includes beaches, mudflats, and sandflats, as well as barrier island beaches and spoil islands (Haig 1992 as cited by USFWS 2013d). On the Gulf Coast, preferred foraging areas are associated with wider beaches, mudflats, and small inlets (USFWS 2013d). Critical habitat is designated on several shorelines along the Florida panhandle adjacent to project areas. PCE's include: 1) Intertidal flats with sand or mud flats (or both) with no or sparse emergent vegetation. 2) Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers. Such sites may have debris, detritus, or microtopographic relief (less than 50 cm above substrate surface) offering refuge from high winds and cold weather. 3) Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas. 4) Washover areas are broad, unvegetated zones, with little or no topographic relief, that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action.

Red Knot

The red knot, a federal proposed species, uses the state of Florida both for wintering habitat and migration stopover habitat for those that continue to migrate down to specific wintering locations in South America (Niles et al. 2008). Wintering and migrating red knots forage along sandy beaches, tidal mudflats, salt marshes, and peat banks (Harrington 2001). Observations indicate that red knots also forage on oyster reef and exposed bay bottoms, and roost on high sandflats, reefs, and other sites protected from high tides (Niles et al. 2008). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Threats to wintering and stopover habitat in Florida include shoreline development, hardening, dredging, deposition, and beach raking (Niles et al. 2008).

Essential Fish Habitat

EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse impacts on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. The EFH within the project area include emergent wetlands, mud substrate, and estuarine water columns for species of fish, such as red drum, brown shrimp, pink shrimp, and white shrimp. There are no marine components of EFH in the vicinity of the project site.

Table 12-42 provides a list of the species that NMFS manages under the federally Implemented Fishery Management Plan in the vicinity of the Florida Artificial Reef project sites which are located in the coastal waters off of Escambia, Santa Rosa, Okaloosa, Walton and Bay counties and the Gulf of Mexico.

Table 12-42. Federally managed fisheries with designated Essential Fish Habitat (EFH) in the proposed project area .

EFH CATEGORY	SPECIES
Atlantic Highly Migratory Species	Angel Shark Adult and Juvenile
	Atlantic Sharpnose Shark Adult
	Atlantic Sharpnose Shark Juvenile
	Atlantic Sharpnose Shark Neonate
	Bignose Shark Adult and Juvenile
	Blacknose Shark Adult
	Blacknose Shark Juvenile
	Blacknose Shark Neonate
	Blacktip Shark Adult
	Blacktip Shark Juvenile
	Blacktip Shark Neonate
	Blue Marlin Adult
	Blue Marlin Juvenile
	Bluefin Tuna HAPC area
	Bluefin Tuna Spawning, Eggs, and Larvae
	Bonnethead Shark Adult
	Bonnethead Shark Juvenile
	Bonnethead Shark Neonate
	Bull Shark Adult
	Bull Shark Juvenile
	Dusky Shark Adult Juvenile
	Finetooth Shark Adult and Juvenile
	Finetooth Shark Neonate
	Great Hammerhead Shark All
	Lemon Shark Adult
	Lemon Shark Juvenile
	Longbill Spearfish Adult and Juvenile
	Longfin Mako Shark All
	Nurse Shark Adult
	Nurse Shark Juvenile
	Oceanic Whitetip Shark All
	Sailfish Juvenile
	Sandbar Shark Adult
	Sandbar Shark Neonate
	Scalloped Hammerhead Shark Adult
	Scalloped Hammerhead Shark Juvenile
	Scalloped Hammerhead Shark Neonate
	Silky Shark All
	Smooth Dogfish
	Spinner Shark Adult
	Spinner Shark Juvenile

EFH CATEGORY	SPECIES
	Spinner Shark Neonate
	Tiger Shark Juvenile
	Tiger Shark Neonate
	Whale Shark All
	White Marlin Adult
	White Marlin Juvenile
Gulf of Mexico Red Drum	Red Drum
Gulf of Mexico Shrimp	Brown Shrimp
	Pink Shrimp
	White Shrimp
Reef Fish Resources of the Gulf of Mexico	Almaco Jack
	Banded Rudderfish
	Black Grouper
	Blackfin Snapper
	Blueline Tilefish
	Cubera Snapper
	Gag
	Goldface Tilefish
	Gray (Mangrove) Snapper
	Gray Triggerfish
	Greater Amberjack
	Hogfish
	Lane Snapper
	Lesser Amberjack
	Mutton Snapper
	Nassau Grouper
	Queen Snapper
	Red Grouper
	Red Snapper
	Scamp
	Silk Snapper
	Snowy Grouper
	Speckled Hind
	Tilefish
	Vermilion Snapper
	Warsaw Grouper
	Wenchman
	Yellowedge Grouper
	Yellowfin Grouper
	Yellowmouth Grouper

State-Listed Birds, MBTA and BGEPA

There are numerous state of Florida–listed bird species with potential for occurrence in and around the beaches near the artificial reef construction site. These include Arctic peregrine falcon (*Falco peregrinus tundrius*), least tern (*Sterna antillarum*), southeastern American kestrel (*Falco sparverius paulus*), American oystercatcher (*Haematopus palliates*), southeastern/Cuban snowy plover (*Charadrius alexandrinus tenuirostris*), osprey (*Pandion haliaetus*), black skimmer (*Rynchops niger*), white ibis (*Eudocimus albus*), and little blue heron (*Egretta caerulea*. All migratory bird species are protected under MBTA. The nesting season in Florida is from February 15 to August 13.

The bald eagle was delisted by the USFWS and is not listed as threatened or endangered by the FWC. The bald eagle is, however, protected by state law pursuant to 68A-16, Fla. Admin. Code and by the U.S. government under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles feed on fish and other readily available mammalian and avian species and are dependent on large, open expanses of water for foraging habitat. In Florida, conservation measures to protect active nest sites during nesting season must be considered to reduce potential disturbances of certain project activities. If bald eagles are found nesting within 660 feet of a proposed construction area, then activities would need to occur outside of nesting season or coordination with the USFWS would occur to determine if a permit is needed, and Florida's *Bald Eagle Management Plan* guidelines would be followed (FWC 2008). According to the FWC Bald Eagle Nest Locator, there are no bald eagle nests within 5 miles of the project site (FWC 2012).

The proposed project was also reviewed for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), respectively. Table 12-43 provides a summary of the different migratory bird groups specifically addressed by this review and summarizes the potential impacts to these groups and associated habitats that could result from the implementation of this project.

Table 12-43. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, roosting, nesting	Seabirds forage in water, res, or nest in terrestrial habitats, both in the general vicinity of the project area. The project will take place nearshore but not near the dune habitat whichy is where most rooting/nesting occurs. The level of project activity in open water is unlikely to startle nesting or resting birds due to distance from terrestrial habitats. Seabirds could be feeding in the area; however, they would likely move from the area of construction due to disturbance.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized inTable 12-44.

Table 12-44. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care will be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity, which they will have. Roosting should not be impacted because the project will occur during daylight hours only. Nesting should not be impacted because the project will not occur near nesting habitats.

Environmental Consequences

Protected Species

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On January 23, 2014 the review of potential impacts to species managed by USFWS was completed (McClain, 2013). The USFWS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect West Indian manatee, piping plover, and red knot (if listed). The USFWS also concurred with the Trustees'determination that the proposed project will have no effect on, five species of sea turtles in terrestrial habitats (green, hawksbill, Kemp's ridley, leatherback, and loggerhead).

Initiation of the consultation of potential impacts on protected species managed by NMFS was initiated on January 30, 2014. The Trustees'review of the potential impacts of the project for protected species managed by NMFS determined the proposed action "may affect, but is not likely to adversely affect" the following species and associated critical habitats in the project implementation area:

- Gulf Sturgeon - The restoration operations associated with this project may affect, but not likely to adversely affect and will not jeopardize the continued existence of the species.
- Gulf Sturgeon Critical Habitat – The project footprint does fall within Gulf sturgeon critical habitat (Unit 11); however, it has been determined that the construction activities associated with this project will not adversely affect designated Gulf sturgeon critical habitat.
- Green Sea Turtle - The restoration operations associated with this project may affect, but not likely to adversely affect and will not jeopardize the continued existence of the species.
- Loggerhead Sea Turtle - The restoration operations associated with this project may affect, but not likely to adversely affect and will not jeopardize the continued existence of the species.
- Loggerhead Critical Habitat – The project footprint intersects loggerhead critical habitat unit LOGG-N-33. However, none of the PCEs associated with this nearshore reproductive habitat unit will be adversely affected by the project.
- Hawksbill Sea Turtle - The restoration operations associated with this project may affect, but not likely to adversely affect and will not jeopardize the continued existence of the species.
- Leatherback Sea Turtle - The restoration operations associated with this project may affect, but not likely to adversely affect and will not jeopardize the continued existence of the species.
- Kemp's Ridley Sea Turtle - The restoration operations associated with this project may affect, but not likely to adversely affect and will not jeopardize the continued existence of the species.

A concurrence from NMFS with the Trustees'conclusions for these species and associated critical habitats is still pending.

The Trustees also evaluated the potential for take of Marine Mammals under the MMPA and due to these species' mobility and the implementation of NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006), *Standard Manatee Conditions for In-Water Work* (USFWS 2011), and USFWS recommended conservation measures for listed species and other trust resources, take of marine mammals under the MMPA is not anticipated.

Essential Fish Habitat

The Trustees'review of the potential impacts to EFH in the proposed locations for the Artificial Reef restoration project determined that while implementing the project would result in a small amount of habitat conversion of one EFH habitat type to another, adjacent habitat would remain unchanged and would be available for use. At the same time, the habitat conversion would be expected to provide a more diverse habitat, which would benefit some species. Therefore, the Trustees determined disturbance to any EFH and species using the habitat in areas adjacent to artificial reef placement would be brief and insignificant, with risks further mitigated by following identified best management practices during construction so no adverse impacts to other EFH types would result from the proposed project.

On March 17, 2014 NMFS completed its evaluation of potential EFH impacts concurred with the Trustees' determination that permanent impacts to soft bottom EFH will occur; however, the provision of new hard structure in the Gulf may create benefits to some species managed under the Magnuson-Stevens Act by providing foraging habitat, cover, and conditions favorable for encrusting benthic colonization (Fay, 2014).

State-Listed Birds, MBTA, and BGEPA

There are no known bald eagle nests within 5 miles of the project site; therefore no impacts to bald eagles are expected. At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

12.19.5.6 Human Uses and Socioeconomics

12.19.5.6.1 Socioeconomics and Environmental Justice

Affected Resources

The populations of Escambia, Santa Rosa, Okaloosa, Walton, and Bay Counties equal 853,708 individuals, representing 4.54% of the population of Florida. See Table 12-45 for the populations in each individual county.

This project would have a short-term, minor, direct adverse impact through disruption of localized fishing during construction. Direct, short-term, moderate benefits through local job creation would result from construction activities. Long-term, indirect, moderate benefits would result from increasing fisheries habitat, and recreational and fishing value of the area, since newly created habitat would be able to support a larger, more diverse fish assemblage.

Environmental Consequences

This project is not designed to create a benefit for any group or individual, but rather would provide benefits on a local basis. There are no indications that the proposed artificial reef project would be contrary to the goals of Executive Order 12898 on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, or would create disproportionate, adverse human health or environmental impacts on minority or low-income populations of the surrounding community.

Direct, short and long-term, minor economic benefits across the multi-county area of project implementation may be realized through local job creation and support from construction. Long-term, indirect, minor benefits could result from increasing recreational opportunities in the project area.

12.19.5.6.2 Cultural Resources

Affected Resources

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Environmental Consequences

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

Table 12-45. Population of Florida and affected counties: Escambia, Santa Rosa, Okaloosa, Walton, and Bay.

TOPIC	FLORIDA[1]		ESCAMBIA		SANTA ROSA		OKALOOSA		WALTON		BAY	
2010 Total Population	18,801,310		297,619		151,372		180,822		55,043		168,852	
White alone	14,721,426	78.3%	212,203	70.1%	18,698	87.5%	156,438	82.3%	51,593	89.6%	142,508	82.9%
Black or African American alone	3,121,017	16.6%	69,322	22.9%	10,303	6.5%	18,628	9.8%	3,455	6.0%	19,081	11.1%
American Indian and Alaska Native alone	94,007	0.5%	2,724	0.9%	1,427	0.9%	1,331	0.7%	518	0.9%	1,203	0.7%
Asian alone	507,635	2.7%	8,779	2.9%	3,170	2.0%	5,893	3.1%	576	1.0%	3,782	2.2%
Native Hawaiian and Other Pacific Islander alone	18,801	0.1%	605	0.2%	317	0.2%	380	0.2%	115	0.2%	172	0.1%
Two or more races	357,225	1.9%	9,081	3.0%	4,597	2.9%	7,223	3.8%	1,324	2.3%	4,985	2.9%
Hispanic or Latino	4,361,904	23.2%	15,438	5.1%	7,767	4.9%	15,397	8.1%	3,397	5.9%	8,939	5.2%
White alone, not Hispanic or Latino	10,716,747	57.0%	199,792	66.0%	132,199	83.4%	143,703	75.6%	48,599	84.4%	135,116	78.6%

[1] U.S. Census Bureau. 2010. Available at: http://quickfacts.census.gov/qfd/index.html. Accessed October 2, 2013.

12.19.5.6.3 Infrastructure

Affected Resources

Artificial reef creation would take place in nearshore and deep, open-water habitats, away from infrastructure. Construction staging areas and access points to Santa Rosa Sound would be located at existing developed areas suitable for such work (e.g., docks, marinas)..

Environmental Consequences

There may be a minor, short-term, temporary increase in traffic and slow-moving construction equipment in the adjacent transportation corridors. The action would affect public services or utilities but the impact would be localized and within operational capacities.

Artificial reef creation would occur in open, nearshore and deep water habitats in in five panhandle counties, so there would be no effect on local infrastructure once equipment and materials reach the construction site. Short-term and long-term impacts to public services would be minor due to the project being located outside any public utilities or traffic areas.

Once construction is complete, there would be no effect to infrastructure.

12.19.5.6.4 Land and Marine Management

Affected Resources

Coastal Zone Consistency

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS (Federal Trustees 2013). The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process (Milligan 2014).

Environmental Consequences

Artificial reef restoration would have a moderate to major beneficial impact on marine management in the Florida panhandle by promoting increased diversity and population sizes of aquatic species as a result of enlarged areas of reef habitat. All project work would be completed consistent with any applicable state and federal management plans.

12.19.5.6.5 Aesthetics and Visual Resources

Affected Resources

Aesthetic and visual resources in artificial reef creation areas are characterized by open-water nearshore habitat.

Environmental Consequences

Short-term, minor impacts to the viewshed may occur during periods when barges and equipment are present to place reef materials. In the long term, there would be no impact to visual resources from the shore or on the water surface.

Artificial reef creation would have a long-term, moderate beneficial impact on underwater aesthetics and visual resources for those who dive or snorkel in the project area following reef emplacement.

12.19.5.6.6 Tourism and Recreational Use

Affected Resources

The primary recreational activities in the Florida panhandle are swimming, boating, fishing, diving, snorkeling, and beach combing. The artificial reefs are intended to attract tourists and other members of the public participating in recreational activities. Locations of the reefs are made publicly available, in part to support increased use.

Environmental Consequences

During the construction, areas may be unavailable to the public, thereby causing minor reduction of the areas available for recreation. After construction, visitor capacity would increase due to the increased habitat available, resulting in a beneficial impact to reef visitation.

12.19.5.6.7 Public Health and Safety and Shoreline Protection

Affected Resources

The project would be conducted at multiple locations throughout the Florida panhandle. The specific public health and safety and shoreline protection conditions at each individual location may vary. Project locations would not be situated in areas with hazardous waste generation or disposal.

Environmental Consequences

Artificial reef creation would have no impact on public health conditions because restoration techniques would follow health and safety guidance and would not take place in areas where public health conditions may be affected. Short-term and long-term impacts would be minor because artificial reef creation would not cause any soil, groundwater, and/or surface water contamination, exposure to contaminated materials, or mobilization and migration of contaminants currently in the soil, groundwater, or surface water that could harm construction workers or the general public. Artificial reefs would be constructed using layered, piling-mounted concrete and stone rubble or prefabricated modular design. All material used in reef creation would be analyzed for presence of contaminants prior to placement.

12.19.6 Summary and Next Steps

The proposed Florida Artificial Reef Creation and Restoration project would place artificial reefs in permitted areas in Escambia, Santa Rosa, Okaloosa, Walton, and Bay Counties. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would enhance and/or increase recreational fishing opportunities by increasing the number of artificial reefs in state waters. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

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12.20 Florida Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center: Project Description

12.20.1 Project Summary

The proposed Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center project would involve constructing and operating a saltwater sportfish hatchery in Pensacola, Florida. This project would enhance recreational fishing opportunities. The total estimated cost for this project is $18,793,500.

12.20.2 Background and Project Description

The Trustees propose to construct and operate a saltwater sportfish hatchery in Pensacola (Escambia County), Florida (see Figure 12-37 for a conceptual design, Figure 12-38 for facility location). The objective of the proposed Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center project is to enhance and/or increase recreational fishing opportunities by producing and releasing highly sought-after sportfish species such as red snapper, red drum, and spotted seatrout. The restoration work proposed includes the construction and operation of a saltwater hatchery. Hatchery production (with a potential for up to 5,000,000 fish released annually) will be based on the use of intensive (i.e., indoor, tank-based) recirculating aquaculture systems that reduce water usage and effluent discharge (i.e., most of the water is re-used). The hatchery fish will be released into high quality inshore habitats throughout the Northern Gulf Coast in Florida. Effluent will flow through a small constructed filtration marsh composed of native coastal wetland plant species to recycle nutrients from the aquaculture facility as plant biomass which can be used to support ongoing regional coastal habitat restoration efforts.

Figure 12-37. Conceptual design for the Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center Project.

Figure 12-38. Location for the Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center Project.

12.20.3 Evaluation Criteria

This proposed project meets the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and related response actions, the public's access to and enjoyment of the natural resources along Florida's Panhandle was denied or severely restricted. The proposed Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center project is intended to enhance and/or increase recreational fishing opportunities by producing and releasing highly sought-after sportfish species. The project would enhance and/or increase opportunities for the public's use and enjoyment from the natural resources, helping to offset adverse impacts to such uses that resulted from the Spill. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

The project is technically feasible and utilizes proven techniques with established methods and documented results. The State of Florida has constructed a similar style hatchery on a smaller scale and has been operating it successfully for multiple decades. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Furthermore, the cost estimates are based on the similar past project and therefore the project can be

conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.20, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration with the exception of geology and substrates, noise, and aesthetics and visual resources which would be minor, localized and long term. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.20 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). This proposed project is not anticipated to negatively affect regional ecological restoration and is therefore not in consistent with the long-term restoration needs of the State of Florida. See Section 6d of the Framework Agreement.

Many recreational use projects, including ones similar to this project, have been submitted as restoration projects on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center project also meets the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by response and SCAT activities for the Spill.

12.20.4 Performance Criteria, Monitoring and Maintenance

As part of the project costs, monitoring will be conducted to ensure project plans and designs were correctly implemented. Monitoring has been designed around the project goals and objectives. The project objective is to enhance and/or increase recreational fishing opportunities by constructing and operating a saltwater sportfish hatchery. Performance monitoring will evaluate the construction and operation of the hatchery. Specific success criteria include: 1) the completion of the construction as designed and permitted; 2) operation of the hatchery as permitted; and 3) enhanced and/or increased public access provided to the natural resources, which will be determined by observation that the hatchery is open and operational.

A detailed project timeline and associated monitoring framework will be developed as the first step in the initial project design phase. Overall project quality control and assurance will be overseen by the Florida Fish and Wildlife Conservation Commission and quarterly progress reports will be prepared to help track the successful implementation, performance, and completion of the various goals and objectives outlined in the scope of work. Existing fisheries monitoring programs will be leveraged to provide information on recreational catch and effort, and abundance of select sportfish species. The project proposal provides for five years of Trustee data collection during which detailed data on fisheries abundance, catch, effort and angler preferences will be collected to define the impact of the project on recreational fishing.

The project proposal also provides for five years of Trustee operation and maintenance which will provide for regular facility maintenance and repair (electrical, plumbing, physical facility, etc.) as well as periodic maintenance and repair of aquaculture systems (including tanks, filtration systems, and

specialized instrumentation). After five years, upkeep and repair of facility buildings as well as maintenance of stormwater and effluent retention ponds, and filtration marsh will be provided by FWC and its governmental, university, or non-profit partners.

12.20.5 Offsets

The Trustees and BP negotiated a BCR of 2.0 for the proposed recreational use project. NRD Offsets are $37,587,000 expressed in present value 2013 dollars to be applied against the monetized value of lost recreational use provided by natural resources injured in Florida, which will be determined by the Trustees' assessment of lost recreational use for the Oil Spill. Please see Chapter 7 of this document (Section 7.2.2) for a description of the methodology used to develop monetized Offsets.[28]

12.20.6 Cost

The total estimated cost to implement this project is $18,793,500. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and contingencies.

[28] For the purposes of applying the NRD Offsets to the calculation of injury after the Trustees' assessment of lost recreational use for the Spill, the Trustees and BP agree as follows:

- The Trustees agree to restate the NRD Offsets in the present value year used in the Trustees' assessment of lost recreational use for the Spill.
- The discount rate and method used to restate the present value of the NRD Offsets will be the same as that used to express the present value of the damages.

12.21 Florida Fish Hatchery: Environmental Review

12.21.1 Introduction and Background

In April 2011, the Natural Resource Trustees (Trustees) and BP Exploration and Production, Inc. (BP) entered into the Framework Agreement for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is underway. The Framework Agreement is intended to expedite the start of restoration in the Gulf of Mexico in advance of the completion of the injury assessment process. Early restoration is not intended to, and does not, fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects would be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement, after public review of a draft, the Trustees released a Phase I Early Restoration Plan (ERP) in April 2012. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, the National Oceanic and Atmospheric Administration (NOAA) issued a public notice in the *Federal Register* on behalf of the Trustees, announcing the development of additional future Early Restoration projects for a Final Phase III ERP/PEIS (ERP). Construction of the Gulf Coast Marine Fisheries Hatchery and Enhancement Center (the hatchery) in Pensacola Bay was submitted as an Early Restoration project on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the state of Florida.

The Florida Fish and Wildlife Conservation Commission (FWC) is proposing to construct a saltwater sport fish hatchery in Pensacola (Escambia County), Florida, to supplement the Port Manatee Stock Enhancement Research Facility (SERF)—the lone State-operated saltwater sportfish hatchery operated in Florida. SERF currently produces juvenile redfish for release statewide. The facility uses mating pairs of redfish, caught in the wild, as brood stock to produce hundreds of thousands of eggs that are incubated until they hatch. The fingerlings are transferred to outdoor ponds or raised in tanks and are tagged and released when they reach the targeted size. Since 1988, six million juvenile redfish have been released, with the majority of them released in Tampa and Biscayne Bays (FWC 2013a). With only one hatchery in the state, it is difficult for the FWC to meet the demand from sport and commercial fishing.

The *Deepwater Horizon* Oil Spill directly affected beaches and estuaries through oil intrusion, which resulted in the closure of state and federal waters for months and had a large impact on Florida's coastal economy.

The proposed hatchery project would fund construction activities to develop a former industrial site into a saltwater sport fish hatchery and support its operation and maintenance activities for a period of 5 years. The proposed hatchery facility would focus on restoring lost recreational fishing use experienced by resident and visiting anglers in Florida. The facility would release up to five million juvenile sportfish such as red snapper (*Lutjanus campechanus*), red drum (*Sciaenops ocellatus*), and spotted sea trout (*Cynoscion nebulosus*) annually into state waters in the Gulf of Mexico. The hatchery fish will be released into high quality inshore habitats throughout the Northern Gulf Coast in Florida.

This hatchery project would be consistent with FWC's efforts over the past 25 years to develop a statewide series of marine hatcheries to enhance fishing and promote marine conservation. The FWC has been actively pursuing this goal since development of SERF in Manatee County as a response, in part, to the declines in the harvest of popular sport fish species, particularly red drum, earlier in the 1980s. This commitment to incorporating marine hatcheries into FWC's fishery management activities was further recognized in 2006 with the implementation of the Florida Marine Fisheries Enhancement Initiative, or FMFEI (FWC 2013a).

The proposed hatchery would draw on lessons the FWC has learned in the 25 years of operation of SERF, and incorporate the latest technological advances in fish culture. The state-of-the-art facility would be designed to incorporate intensive aquaculture techniques and approaches, including the use of an indoor-tank-based rearing system where approximately 80% of the initial saltwater withdrawals from Pensacola Bay would be reused. In addition, the water that is eventually discharged from the facility would go through a treatment process that focuses on the recycling of nutrients. Effluent from the facility would flow through a small filtration marsh composed of native coastal wetland plant species (to be built as part of the hatchery project); the nutrients would provide fertilizer to support an adjoining nursery. Plants produced at the nursery and in the wetland would be used to support ongoing regional coastal habitat restoration efforts.

Developing the hatchery would help satisfy FMFEI's objectives of increasing recreational fishing opportunities and promoting marine conservation, while providing an economic boost to the Pensacola economy.

This proposed project meets the evaluation criteria of the Framework Agreement and the Oil Pollution Act (OPA). As a result of the *Deepwater Horizon* Oil Spill and related response actions, the public's access to and enjoyment of the natural resources along Florida's panhandle was denied or severely restricted. The proposed Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center project is intended to enhance and/or increase recreational fishing opportunities by producing and releasing highly sought-after sportfish species. The project would enhance and/or increase opportunities for the public's use and enjoyment of the natural resources, helping to offset adverse impacts to such uses that resulted from the Spill.

12.21.2 Project Location

The proposed hatchery project area is located on 10 acres in Escambia County at the southeast corner of Main Street and Clubbs Street in Pensacola, Florida (Figure 12-39 and Figure 12-40). The hatchery facilities and ponds will be constructed on the upland portion of the site. According to the Wetland Sciences, Inc. report (2013), there are three areas immediately adjacent and within the subject property that have been developed as wetland mitigation areas: the Bruce Beach marsh immediately to the south, the City of Pensacola Southern Bulkhead Mitigation Area immediately to the east, and the Community Maritime Park (CMP) wetland mitigation area immediately south of the Bruce Beach marsh (Figure 12-42). Finally, a bulk petroleum storage facility (Transmontaigne Product Services., FDEP Facility ID No. 178508201) is located immediately west of the proposed project site (Figure 12-41).

Records indicate the Bruce Beach marsh was planted in 1991 by the Florida Department of Environmental Protection's Ecosystem Restoration Section. This mitigation area was formed by the

construction of an L-shaped breakwater and infill of submerged lands of Pensacola Bay. Originally, smooth cordgrass (Spartina alterniflora) was established on one-meter centers throughout the entire created area. Hydrology within the site was established through tidal ebb and flow whose influences are manifested by a gap in the constructed breakwater which effectively connected the mitigation site to Pensacola Bay (Wetland Sciences, Inc. 2013).

The Southern Bulkhead Mitigation Area site was designed to compensate for wetland losses incurred with the construction of the southern bulkhead along the waterfront of what is now the Community Maritime Park. This mitigation site was once a channelized canal formerly used to discharge treated effluent from a now decommissioned wastewater treatment plant. The mitigation site is comprised of a meandering tidal channel and low/high marsh areas planted with smooth coordgrass and marsh hay (Spartina patens) (Wetland Sciences, Inc. 2013).

The Community Maritime Park (CMP) wetland mitigation area was established in 2012 to compensate for loss of wetland functions that were eliminated by the construction of the Pensacola Community Maritime Park. The wetland mitigation plan included the creation of a salt marsh consisting of 0.86 acres of oyster reef habitat/breakwaters, 1.96 acres of planted salt marsh, and 1.72 acres of tidal creeks and pools which serve as a waterward extension of the existing Bruce Beach mitigation area. The mitigation plan also included modifications to the existing Bruce Beach Mitigation Area. These modifications included the re-grading of adjacent uplands to intertidal elevations for additional marsh creation and opening the southern end of the site to enhance tidal exchange between Bruce Beach and the CMP mitigation areas. This mitigation site is protected via a conservation easement recorded in OR Book 6417 Pages 1666- 1680 in the official records of Escambia County (Figure 12-42) (Wetland Sciences, Inc. 2013).

These three mitigation areas will not be affected by the construction activities and should benefit from the improved quality of the water returned to the bay through the hatchery's treatment processes relative to the uncontrolled nature of the current surface water runoff from the site.

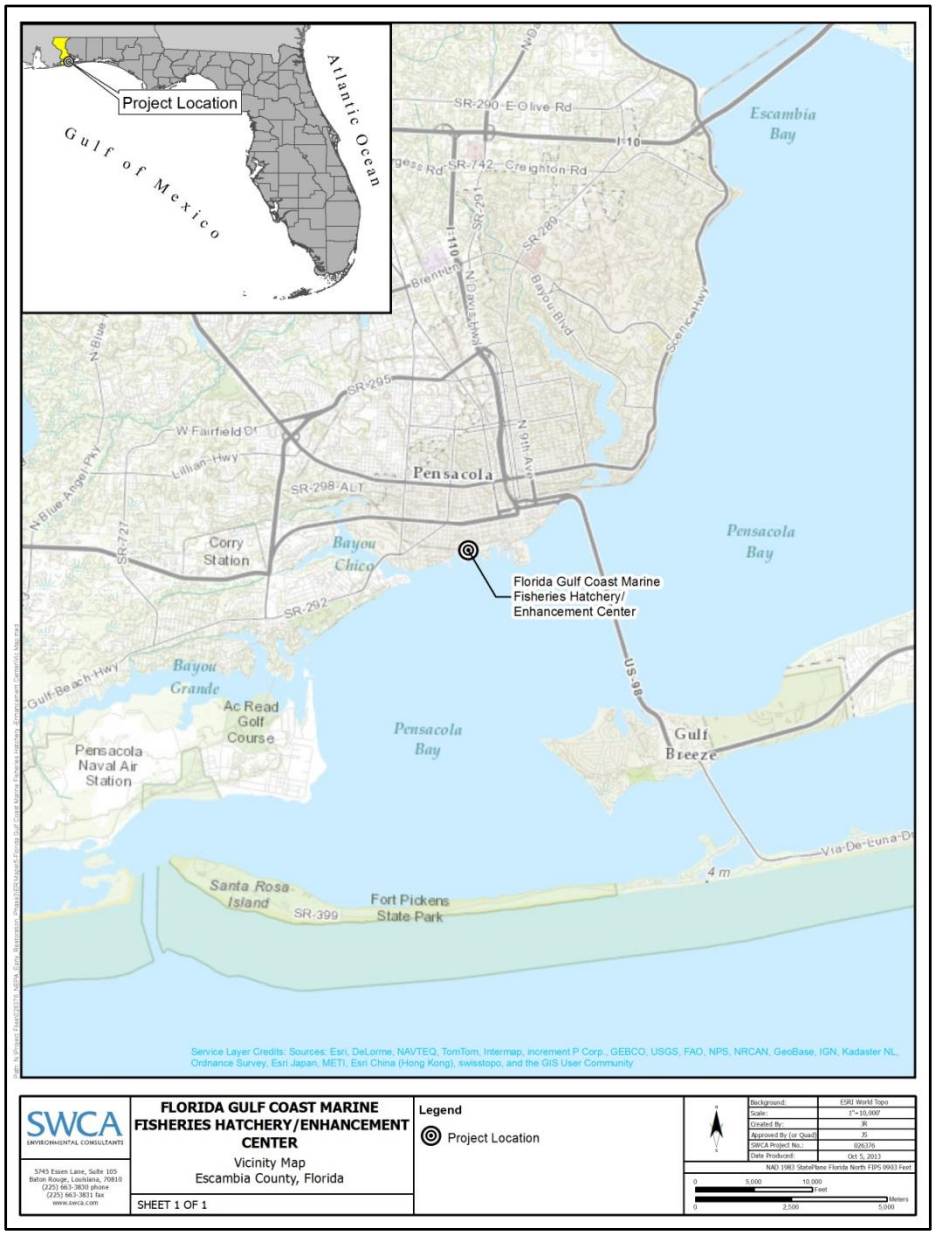

Figure 12-39. Vicinity map of the proposed hatchery project in Pensacola, Florida.

Figure 12-40. Aerial map of proposed hatchery project in Pensacola, Florida.

Figure 12-41. Approximate boundary of the proposed hatchery project location in Pensacola, Florida.

Figure 12-42. Wetland mitigation areas near the proposed hatchery project in Pensacola, Florida.

12.21.3 Construction and Installation

Figure 12-43 provides a conceptual rendering of the proposed hatchery.

Critical indoor project elements identified in Figure 12-43 include:

- Five-Room, Phase 1 Module Building (illustrated in white, adjacent to parking area):
  - **Entrance and offices:** A portion of the main facility building would contain offices for the staff. An entrance located adjacent to the parking lot would be developed for access by staff and visitors. A separate service entrance would be developed for the delivery of hatchery and administrative supplies.
  - **Brood stock rooms (2):** There would be two rooms where adult fish would be held in 115,000-gallon tanks for spawning. These broodstock fish would produce the fertilized eggs that the hatchery would then grow in the phase I tank rooms (see below) until they are large enough for release.
  - **Phase 1 tank rooms (2):** There would be two rooms where hatchery-raised fish would complete their grow-out to the Phase 1 size of approximately 1.25 inches in length, at which point they would be ready for release. The Phase 1 tanks would be 95,000-gallon capacity.

Live feed room (1): This room would contain smaller tanks that would grow the food necessary to feed the cultured sport fish. Depending on the species, this could include various species of phytoplankton and zooplankton.

Figure 12-43. Conceptual rendering of the proposed hatchery project in Pensacola, Florida.

Critical outdoor project elements identified in Figure 12-43 include:

- **Stormwater pond**: A stormwater retention pond would be developed to capture rain water flowing from impervious surfaces on and near the site during storm events. This pond would be used to settle solids and allow for some groundwater recharge. Pond discharge would be integrated into the surface waters being directly returned to Pensacola Bay from the site. The exact size of the pond and conditions and mechanisms of the return flow to Pensacola Bay (e.g., size of pond related to the amount of impervious surface in the final design) would be defined in the final engineering plans.
- **Storage pond:** A lined storage pond up to 1 acre in size would be used to store hatchery fish production effluent. Effluent would be diverted to the pond after initially filtering out solids inside the facility. The pond would allow for additional settling of solids entrained in the hatchery's fish production water, and the liner would facilitate removal of fish waste and other biological material. Water from the storage pond would flow into the plant production pond.
- **Plant production pond/filtration marsh:** This approximately 2-acre pond or marsh would receive discharge from the storage pond and be planted with native wetland species, including *Spartina alterniflora*, to uptake nutrients that improve water quality before water would be returned to Pensacola Bay as sheet flow. The wetland plants would be harvested to remove nutrients from the marsh and used to support other coastal restoration projects. To the

maximum extent possible, this constructed marsh would be integrated with the existing wetland and marsh mitigation areas that are on and adjacent to the proposed hatchery location.

- **Parking lot:** An on-site lot of approximately 90,000 square feet would be developed to provide parking for hatchery staff and visitors. Access to the lot would be via Clubbs Street, which has minimal traffic and would dead-end at the facility parking lot.

The proposed Pensacola hatchery would draw on lessons the FWC has learned in the 25 years of operation of SERF, combined with technological advances in developing hatcheries. The state-of-the-art facility would be designed to incorporate intensive aquaculture techniques and approaches, including the use of an indoor-tank-based rearing system where approximately 80 percent of the initial saltwater withdrawals from Pensacola Bay would be reused.

To supply the hatchery with seawater, a horizontal bore would be drilled from an upland area located above the mean high water line out into Pensacola Bay under the seafloor for a seawater supply pipe. This pipe would feed into an a well placed in an onshore excavation associated with the bore so that pumping of the seawater from the offshore area and from the well to the hatchery could take place using equipment located on shore above the mean high water line. During all drilling activities BMPs designed to control erosion (e.g., use of hay bales) and limit turbidity impacts to the Bay waters would be implemented and actively maintained.

To complete the supply infrastructure the horizontal bore and main supply pipe would proceed to a location in Pensacola Bay where the environmental conditions ensure a consistent supply of sea water with desired characteristics (e.g., salinity, temperature). These characteristics are largely depth dependent. At the desired location, a small riser section of pipe would be connected so that it emerged from the seafloor and would continue until roughly it was located 1-2 feet off the seafloor. This riser section will have a screened opening for the seawater to prevent the impingement and entrainment of sea organisms. Based on the volume of seawater it is expected the hatchery will require, it is expected the supply pipe and intake riser section would not be greater than 8” in diameter.

As part of the supply pipe siting, there would be an assessment of seagrass areas and these habitats would be avoided so that the riser is located in an area characterized by sand/silt sediments that are clear of seagrass in water that is 7-14 feet deep, measured at mean low water, within a “box” whose corners are described below in terms of their latitude and longitude (measured in decimal degrees).

Box corner	**Latitude (N)**	**Longitude (W)**
Northwest	30.40302	87.22223
Northeast	30.40333	87.22027
Southeast	30.40049	87.21956
Southwest	30.40013	87.22152

To minimize potential risks of impingement and entrainment the intake pipe would incorporate that a design and screen that ensures water velocity at the screen is less than 15 cm/second (equivalent to 0.15m/s) when water is being pumped. While a specific device has not been identified or designed at this time there area commercially available options that would meet this requirement.

The cumulative duration of work for establishing this in-water supply source of seawater would be three months. This would include water-based surveys and the construction work associated with attaching the vertical riser pipe to the main supply pipe in the horizontal bore. During attachment of the vertical riser, a small area of the seafloor would be temporarily disturbed to expose the supply pipe and complete the connection. It is expected that this area would be no more than 1600 square feet (40 x 40'). At the end of the connection activity the original grade of the seafloor would be reestablished by returning the sediment so that only the vertical riser remained.

To further reduce risks and potential in-water impacts to protected species, all in-water work would comply with the recommendations contained within the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS, 2006) and the Standard Manatee Construction Conditions for In-Water Work (USFWS, 2011) guidance documents.

The water treatment center for the hatchery may include chlorine or ozone disinfection, a settling tank to remove suspended solids, mechanical filtration, and a water distribution system (valves and plumbing) to direct water to specific areas of the hatchery.

Waste water from the hatchery would pass through an approximately 2-acre constructed marsh or wetland to remove suspended solids and nutrients from the waste stream. The marsh would also serve as a wetland plant supply for restoration projects. The marsh or wetland would be designed to distribute water equally to the marsh wetland plants to facilitate uniform growth of plants and nutrient stripping by the plants from the waste stream. Several species would be planted in the marsh at strategic elevations to provide the appropriate water inundation or exposure to the plants. Discharge from the marsh would be controlled seasonally by means of weir boards into a poly-lined ditch that can then lead directly to an open system such as a natural marsh, open bay, or lead to a culvert pipe that drains into the natural system. An elevated culvert pipe minimizes tidal inundation of bay waters into the drainage system that could lead to colonization of encrusting organisms in the culvert such as barnacles and oysters. Environmental Protection Agency (EPA) permitting requirements for operating a fish hatchery are detailed in 4 C.F.R. 122, in Sections 1(b)(2)(ii), 24, and Appendix C. Hatcheries producing less than 100,000 pounds of warm-water species per year, as would be the case with the proposed facility, are exempt from obtaining a National Pollutants Discharge Elimination System permit. The hatchery project would be required to obtain an Industrial Wastewater Permit from FDEP. An Aquaculture Certification (Section 597.004, Florida Statute [FS]) would also be required from the Florida Department of Agriculture and Consumer Services (FDACS) Division of Aquaculture. Development of the hatchery project would adhere to the FDACS Aquaculture Best Management Practices Rule (Chapter 5L-3, Fla. Admin. Code).

Permitting and construction to complete these hatchery elements would take place over approximately 12 to 18 months. Heavy equipment (e.g., excavators, backhoes, graders) would be needed to clean, excavate, and develop the site. Additional equipment (e.g., lifts, cranes) would be used in the construction of the building and the aquaculture facilities. Assumed equipment use and manpower requirements derived from the conceptual design phase are detailed in Table 12-46.

Table 12-46. Assumed equipment use and worker needs.

EQUIPMENT	NO. USED	NO. OF DAYS USED	NO. OF WORKER DAYS	ASSUMPTIONS
Cranes (pile driving and lifting)	2	180	360	8 hr/day, 5 days/week, 9 months
Front-end loader	2	120	240	8 hr/day, 5 days/week, 6 months
Backhoe	1	60	60	8 hr/day, 5 days/week, 3 months
Triple axel dump trucks	6	75	450	75 trips
Motorgrader	1	20	20	8 hr/day, 5 days/week, 1 month
Bulldozer (D-7)	1	60	60	8 hr/day, 5 days/week, 3 months
Portable pump (dewatering system)	1	56	56	24 hr/day, 7 days/week, 2 months
Tractor trailer (material delivery)	1	104	104	2 trips/week, 12 months (52 weeks)
Concrete trucks	4	128	512	2 trips/week, 4 months (16 weeks)
Generator	2	180	N/A	8 hr/day, 5 days/week, 9 months
Small power tools (saws, drills, nail guns)	26	180	50 skilled/semi-skilled	8 hr/day, 5 days/week, 9 months
Total	**-**	**-**	**1,912**	**-**

At least 26 small tools (e.g., nail guns, saws, drills) would be needed and would be operated approximately 8 hours per day, 5 days per week, for up to 9 months. A generator would be needed to power the small tools, which would operate for about 8 hours per day, 5 days per week, for up to 9 months. In addition, a pumping station would operate intermittently during the final phases of constructing the facility, and once the facility is running would be operating 24 hours a day for the life of the facility, with the exception of maintenance and other potential shutdowns.

12.21.4 Operations and Maintenance

The proposed hatchery would be operated and maintained by a team of 9 to 15 staff to support the production and release of up to five million marine sport fish (juvenile red snapper, red drum, and spotted sea trout) annually into Florida waters of the Gulf of Mexico. The production of sport fish would be conducted in a manner consistent with the relevant rules and best management practices (BMPs) that have been developed for the release of marine organisms in the state of Florida (FWC 2009a, 2009b, 2009c). These rules and guidance describe conditions under which marine organisms may be collected, as well as considerations to be addressed prior to the release of any marine organisms into the environment (e.g., genetic risk from the release). FDACS regulates aquaculture operations and enforces compliance with relevant regulations. FWC has had a long-term, productive working relationship with FDACS in regard to operations at the current hatchery at Port Manatee, including permitting of effluent discharge according to state aquaculture guidelines. FWC has authority derived from the state constitution to conduct the types of operations associated with the proposed hatchery.

Production of reared fish would take place indoors at the hatchery, rather than in outdoor holding and rearing ponds common to similar facilities. Hatchery fish production would be based on the use of intensive (i.e., indoor, tank-based) recirculating aquaculture systems that reduce water usage and effluent discharge (i.e., most of the water is reused). Effluent would flow through a small constructed filtration marsh composed of native coastal wetland plant species to recycle nutrients from the

aquaculture facility as plant biomass, which can be used to support ongoing regional coastal habitat restoration efforts.

Successful production of fish and hatchery operations would require three general activities:

- Collection of brood stock;
- Rearing of captive spawned sport fish from brood stock eggs; and
- Release of hatchery fish to marine environments.

These steps are further described below.

12.21.4.1 Collection of Brood Stock

Brood stock (adult male and female fish of the targeted species) would be collected from Florida's state waters under existing research and species collection permits held by FWC. Generally, these adult fish would be collected using standard fishing gear (e.g., baited lines, nets). Once collected, the adult fish would be transported to the hatchery and transferred to the brood stock room tanks. Spawning of these fish would be stimulated by adjusting environmental cues (e.g., day length, water temperature) to simulate natural spawning cycles.

12.21.4.2 Rearing of Captive Spawned Sport Fish

Fertilized eggs in the brood stock tank would be buoyant which facilitates collection from the water surface of the tanks. This collection technique has been used successfully for more than 25 years at SERF and would be modified as needed, based on site-specific conditions at the proposed hatchery. The fertilized eggs would be transferred to incubation chambers and maintained until their yolk sacs are absorbed. At that time they would be transferred to phase 1 grow-out tanks.

In the grow-out tanks, the fish would be raised on a diet of live feed, phytoplankton and/or zooplankton, which would be produced on-site in the separate live feed room. Growth of hatchery fish would be monitored and graded by size. Fish would be transferred over time to a series of tanks to minimize cannibalism until they reach the desired size for release. The goal for the phase 1 size is approximately 1.25 inches. When the fish reach this size, they would be collected from the tanks and transported by truck and/or boat to release sites identified by FWC staff. These sites would be located in suitable habitat for juvenile fish such as seagrass beds located throughout the northern Gulf of Mexico.

12.21.4.3 Seawater Management

Seawater pumped to the facility would be treated prior to use. The seawater treatment may include disinfection, either through chlorine or ozone, a settling tank to remove suspended solids, mechanical filtration, and a water distribution system (valves and plumbing) to direct water to specific areas of the hatchery.

Water that is not reused would be treated in two phases. The first phase would consist of on-site filtration to remove large solids. The solids would be disposed of by Emerald Coast Utilities Authority. Next, the water would flow to the storage pond to allow the settling of additional solids. The remaining effluent would be transported to the plant production pond or filtration marsh where nutrients would be removed by native plants before the water is returned as sheet flow back to Pensacola Bay.

The marsh or wetland would be designed to distribute water equally to the marsh wetland plants to facilitate uniform growth of plants and nutrient uptake by the plants from the waste stream. Several species would be planted in the marsh at strategic elevations to provide the appropriate water inundation or exposure to the plants. The marsh would serve the additional purpose of supplying wetland plants for restoration projects.

12.21.4.4 Additional Operation Considerations

Additional operational guidelines and programs for the facility would be developed, implemented, and refined over time as needed and based on the FWC's more than 25 years of experience operating the SERF hatchery in Port Manatee. For example, SERF has a power outage protocol that could be reviewed for relevance and then adopted or modified as needed for the proposed hatchery.

12.21.4.5 Maintenance

The project proposal provides for 5 years of Trustee operation and maintenance, which would provide for regular facility maintenance and repair (electrical, plumbing, physical facility, etc.) as well as periodic maintenance and repair of aquaculture systems (including tanks, filtration systems, and specialized instrumentation). After 5 years, upkeep and repair of facility buildings as well as maintenance of stormwater and effluent retention ponds and filtration marsh would be provided by FWC and its governmental, university, or non-profit partners.

A hatchery maintenance plan would be developed that provides specific plans for short- and long-term equipment inspection, repair, and replacement. Short-term maintenance would include regular facility upkeep (e.g., cleaning) and periodic inspection and repair of aquaculture systems including tanks, filtration systems, specialized instruments, and basic facility systems (e.g., electrical, plumbing). Long-term maintenance would include provisions for upkeep and repair of facility buildings, stormwater pond, storage pond, and the plant production pond or filtration marsh to ensure effective productivity.

12.21.5 Affected Environment and Environmental Consequences

Under the National Environmental Policy Act, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

12.21.5.1 No action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

Under No Action, the existing conditions described for the project site in the affected environment subsection would prevail. Restoration benefits associated with this project would not be achieved at this time.

12.21.5.2 Physical Environment

The proposed location for the hatchery is a roughly 10-acre, human-made parcel that was created in the early 1900s by filling in a portion of Pensacola Bay. Although currently vacant, the site has a history of documented industrial activity since 1910 (Wetland Sciences, Inc. 2013). The site is currently

characterized as "highly disturbed" and extensively covered with construction debris. Three remnant patches containing native and exotic vegetation are present in the hatchery project area, which is bordered by wetland mitigation areas (Wetland Sciences, Inc. 2013).

12.21.5.2.1 Geology and Substrates

Affected Resources

The soil and substrate at the proposed hatchery site have not been surveyed. According to the Natural Resources Conservation Service (2013), local soils are characterized as Lakeland-Hurricane Complex. However, the upland hatchery project area was created by filling in historically coastal areas, which may have been altered over time by industrial activity. The following description assumes local soils were used as fill.

The Lakeland-Hurricane Complex are nearly level to moderately sloping, excessively drained, and somewhat poorly drained soils that are sandy throughout on coastal lowlands. This map unit consists of soils on broad, low ridges in the southern part of the county, primarily in and around the city of Pensacola. The landscape consists of long, smooth slopes and has little relief. Slopes range from 0% to 8%.

Environmental Consequences

Development of the hatchery project would significantly disturb the soils where excavation and re-grading for the hatchery building, parking lot, and associated ponds and treatment marsh (see Figure 12-43) is necessary. The hatchery project would result in major, long-term impacts to soils where development occurs. However, since the area was historically filled from off-site soils, it is unclear whether disturbance is occurring to native soils.

12.21.5.2.2 Hydrology and Water Quality

Affected Resources

Northwest Florida has seven major watersheds, all of which have been identified as priorities under the Surface Water Improvement and Management (SWIM) program. Water quality protection is the underlying goal of SWIM, along with the preservation and restoration of natural systems and associated public uses and benefits (Northwest Florida Water Management District [NFWMD] 2011). The hatchery project is located in the Pensacola Bay watershed system, which includes Pensacola, Escambia, Blackwater, and East Bays; the western portion of Santa Rosa Sound; and numerous rivers and bayous. The total drainage area covers nearly 7,000 square miles, about 34% of which is in Florida. The entire system discharges into the Gulf of Mexico, primarily through a narrow pass at the mouth of Pensacola Bay (NFWMD 2013). Broad issues for the Pensacola Bay system include water and sediment quality degradation through point and nonpoint pollution sources; habitat quality, which is threatened by and degraded through sedimentation and deposition; and management and coordination between two states and numerous local governments and agencies (Thorpe et al. 1997).

With regard to groundwater, the principal water-bearing aquifers are the Surficial Aquifer System (which includes the Sand and Gravel Aquifer) and the Floridian Aquifer System. The Sand and Gravel Aquifer supplies most of the public water supply in Escambia County (NFWMD 2011). Based on Federal Emergency Management Agency (FEMA) flood insurance rate maps (see Panel 12033C0390G), the

hatchery project is located in the coastal area located in Zone AE. Zone AE has defined base flood elevations and is an area of special flood hazard (FEMA 2006).

The presence of concrete and other debris, combined with an assumption of poorly drained soils, would result in surface water flow across the hatchery project area. It is likely that discharge from the site occurs into the adjacent wetland mitigation sites on the eastern and southwestern boundaries of the property (Wetland Sciences, Inc. 2013). These marshes would improve the quality of surface water runoff from the hatchery project site before flow reaches the bay. The property is surrounded by developed land, including a major road, refinery or storage facility, commercial buildings, a former Emerald Coast Utilities Authority wastewater treatment plant, and a recently built ball field and facility. These impermeable surfaces would not facilitate infiltration and aquifer recharge, but would encourage surface runoff.

Environmental Consequences

Hydrology of the project site would be affected by the development of the hatchery facility. In the short term, particularly during the period of intensive excavation and grading, there is the potential for increased sediment transport off the construction site during storm events. Incorporation of BMPs for construction (e.g., silt fencing, hay baling sensitive areas) would ensure that these potentially adverse water quality impacts are minimized. Current surface water flows and subsequent discharges to Pensacola Bay are not controlled or actively managed. The development of the stormwater retention area in conjunction with the hatchery development would result in implementation of a coordinated, engineered approach for managing the quality of stormwater, or freshwater flows, or both, and prevent discharge of pollutants into Pensacola Bay.

SERF's success with capturing and controlling surface water flows and improving water quality sets the precedent for the development of a similar system for the proposed hatchery. Monitoring associated with the SERF industrial wastewater permit improved water quality, resulting in a determination letter from FDEP that the permit was no longer required. Based on this experience and the opportunity to incorporate similar methods and technology, the hatchery project should result in no long-term degradation of water quality. Given the current potential for uncontrolled runoff to the bay, the hatchery project is likely to have short- and long-term benefits to water quality by ensuring discharge to the bay meets strict water-quality criteria for nutrients and other impurities as required by an industrial wastewater permit.

Construction of the stormwater system would ensure that the hatchery project would not affect the performance of the existing wetland mitigation areas. Water quality monitoring would be required by the industrial wastewater permit to ensure there is no water quality impairment resulting from discharges into the bay. All permit conditions, including mitigation measures for siltation, erosion, turbidity, and release of chemicals, would be strictly adhered to. During construction, BMPs along with other avoidance and mitigation measures required by state and federal regulatory agencies would be employed to minimize any water quality and sedimentation impacts. FDEP permit conditions require erosion and turbidity mitigation measures, which include:

- Installation of floating turbidity barriers;
- Installation of erosion control measures along the perimeter of all work areas;
- Stabilization of all filled areas with sod, mats, barriers, or a combination; and

- Stoppage of work if turbidity thresholds are exceeded. The soils would then be stabilized, work procedures would be modified, and the FDEP would be notified.

The proposed discharge of dredged or fill material into waters of the United States, including wetlands, or work affecting navigable waters associated with this project is currently being coordinated with the U.S. Army Corps of Engineers (USACE) pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). Coordination with the USACE and final authorization pursuant to CWA/RHA will be completed prior to project implementation.

There is the potential for short-term, minor adverse impacts to water quality associated with construction activities but these would be minimized by using BMPs. Over the long term, water quality of flows on the site and the saltwater discharges used in production would likely result in a minor benefit with the development of the hatchery.

12.21.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

The Clean Air Act (CAA) requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. NAAQS have been set for six common air pollutants (also known as criteria pollutants)—particle pollution or particulate matter, ozone, carbon monoxide, sulfur dioxide (SO_2), nitrogen dioxide, and lead. Particulate matter is defined as fine particulates with a diameter of 10 micrometers or less (PM_{10}) and fine particulates with a diameter of 2.5 micrometers or less ($PM_{2.5}$). When a designated air quality area or airshed in a state exceeds a NAAQS, that area may be designated as a *nonattainment* area. Areas with levels of pollutants below the health-based standard are designated as *attainment* areas. To determine whether an area meets the NAAQS, air monitoring networks have been established and are used to measure ambient air quality. The EPA also regulates 187 hazardous air pollutants (HAPs) that are known or suspected to cause cancer or other serious health impacts.

Air quality in the Florida panhandle is in attainment with the NAAQS (EPA 2013a). The FDEP operates two monitors in Escambia County. The Ellyson Industrial Park monitor in Ferry Pass records ozone, $PM_{2.5}$, and SO_2 concentrations. The Naval Air Station monitor records ozone concentrations. Readings at both monitors for the last 3 years show attainment with the NAAQS for ozone and SO_2 (FDEP 2013b). $PM_{2.5}$ attainment data were not available (EPA 2013a).

Total greenhouse gas (GHG) emissions in the state of Florida from 1990 to 2007 have increased at an average rate of 2.1% per year. Total GHG emissions in 2007 were 290 million metric tons of carbon dioxide (CO_2) equivalent ($MMTCO_2E$). In 2007, 91% of GHG emissions in Florida were CO_2 emissions (FDEP 2010). According to the EPA, the average annual temperature in the southeast portion of the United States has increased by approximately 2.0 degrees Fahrenheit (°F) since 1970. Average annual temperatures in the region are projected to increase from 4°F to 9°F by 2080. Hurricane-related rainfall is projected to continue to increase. Models suggest that rainfall would arrive in heavier downpours with increased dry periods between storms. These changes would increase the risk of both flooding and drought. The coasts would likely experience stronger hurricanes and sea level rise. Storm surge could present problems for coastal communities and ecosystems (EPA 2013b).

Environmental Consequences

Project construction would require the use of heavy mechanized equipment, which would lead to temporary air pollution (e.g., criteria pollutants, HAPs, GHGs) due to emissions from the operation of construction vehicles and equipment. Any air quality impacts that occur would be minor due their localized nature, short-term duration, and the small size of the hatchery project. Available BMPs would be employed to prevent, mitigate, and control potential air pollutants during project implementation. No air quality–related permits would be required.

Construction of the hatchery would require use of equipment that would contribute to air quality emissions and GHGs such as CO_2. Due to the small area, the exhaust emissions are expected to be minor, with bulldozer, backhoe, and grader being the most likely equipment used to prepare the site to be developed. Any air quality degradation would be very limited to the area immediately around the construction site and would only last during the site preparation period—expected to be less than 6 months. Table 12-47 describes the likely GHG emission scenario for the implementation of this hatchery project.

Table 12-47. Projected greenhouse gas impacts of the proposed project for major construction equipment.

EQUIPMENT DESCRIPTION	TOTAL HOURS USED	CO_2 FACTOR-MT/100 HRS	CO_2 (MT)	CH_4 FACTOR-MT/100 HRS	CH_4 (MT)	N_2O FACTOR-MT/100 HRS	N_2O (MT)	TOTAL CO_2 (MT)
Triple axel dump trucks	300	1.7	5.1	0.5	1.5	7.2	21.6	28.2
Concrete trucks	512	1.7	8.7	0.5	2.6	7.2	36.9	48.1
Tractor trailer	416	1.25	5.2	0.4	1.7	5.5	22.9	29.7
Pickup trucks	7,200	1.1	79.2	0.35	25.2	4.4	316.8	421.2
Motorgrader	160	2.25	3.6	0.65	1.0	1.08	1.7	6.4
Backhoe	480	2.55	12.2	0.85	4.1	10.2	49.0	65.3
Bulldozer	480	2.25	10.8	0.65	3.1	1.08	5.2	19.1
Front-end loader	960	2.25	21.6	0.65	6.2	1.08	10.4	38.2
Cranes	1,440	2.55	36.7	0.85	12.2	10.2	146.9	195.8
Total	**11,948**							**852**

mt = metric tons
Ch_4 = methane
N_2O = nitrogen dioxide

Based on the assumptions detailed in Table 12-46 and calculations shown in Table 12-47, the project would generate approximately 852 metric tons of GHGs over the duration of the project. The following mitigation measures have been identified to reduce or eliminate GHG emissions from the project.

- Shut down idling construction equipment, if feasible.
- Locate staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites.
- Encourage the use of the proper size of equipment for the job to maximize energy efficiency.
- Encourage the use of alternative fuels for generators at construction sites, such as propane or solar, or use electrical power where practicable.

The project would have short-term, minor impacts but no long-term impacts on GHG emissions. Mitigation measures would minimize GHG emissions.

Air quality in the hatchery project area may also be affected by dust associated with construction. However, incorporating BMPs (e.g., wetting to control fugitive dust, limited idling) during construction would help mitigate these impacts. These BMPs would be incorporated in construction permits. Long-term air quality impacts from the hatchery operation are expected to be minor. The integration of energy efficient equipment and a facility design and construction focused on the use of green technologies (for instance, those incorporated as part of LEED or similar certification) would offset any short-term, minor contributions of GHGs. Energy efficiency would help minimize the hatchery's net electricity consumption and thereby help minimize emissions of GHGs associated with the electricity used to operate the facility. At the same time, the development of vegetated areas, particularly the plant production pond or filtration marsh, would increase on-site vegetative production and act as a potential minor carbon sink.

12.21.5.2.4 Noise

Affected Resources

Noise can be defined as unwanted or nuisance sound. The Noise Control Act of 1972 (42 USC 4901 to 4918) was enacted to establish noise control standards and to regulate noise emissions from commercial products such as transportation and construction equipment. Amplitude is the magnitude of a sound and is usually expressed in decibels (dB), which is a dimensionless ratio of sound pressure to a reference pressure. The A-weighted decibel (dBA) is the adjusted unit of sound used to describe the human response to noise from industrial and transportation sources. The threshold of hearing is 0 dB. A 3-dB increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear. Table 12-48 shows typical noise levels for common sources expressed in dBA. Noise exposure depends on how much time an individual spends in different locations.

The hatchery project site is surrounded by a developed, industrial urban environment with a heavily used roadway immediately to the north. A baseball stadium located approximately 0.5 mile west of the project site appears to be the major recreation site in the area. Given the location, the road likely receives considerable industrial traffic including large trucks and periodic heavy pedestrian traffic due to the baseball facility. No residential properties are located in the vicinity. No sensitive wilderness areas or special wildlife use areas are located near the project site.

Table 12-48. Typical noise levels for common sources.

NOISE SOURCE OR EFFECT	SOUND LEVEL (DBA)
Rock-and-roll band	110
Truck at 50 feet	80
Gas lawn mower at 100 feet	70
Normal conversation indoors	60
Moderate rainfall on foliage	50
Refrigerator	40
Bedroom at night	25

Source: Adapted from U.S. Department of Energy and Bonneville Power Administration (1986)

Environmental Consequences

Construction activities, including use of heavy equipment such as graders and backhoes and smaller handheld tools such as saws and nail guns, would cause an increase in noise during the day for the duration of construction. Standard state contract provisions include restricting work to weekdays, normally from 7 a.m. to 7 p.m., unless in a hospital or strictly residential area. Contractors are normally not allowed to work outside these limits unless it is for safety, traffic, or highly restricted schedules, and then it must be by permission. In addition, state contracts require that all equipment used on-site must be properly muffled and in good repair. As a result, short-term noise impacts are expected to be minor, but would impact at least one local business, Nick's Boathouse, a restaurant at the adjacent marina, less than 0.25 mile to the east.

Potentially loud equipment would be during various phases of construction. Noise levels would depend on equipment being used and tasks being performed. Therefore, levels of noise would vary from low to moderate during the 12-month construction period.

In the long term, noise impacts would be minor. The main hatchery operations would occur within the building, so contribution to ambient outdoor noise levels would be negligible. Site maintenance would contribute minor and infrequent noise. Vehicle traffic would be mostly confined to staff and visitors, consisting of passenger vehicles and infrequent deliveries by truck. The building noise would consist of heating, ventilation, and air conditioning (HVAC) systems and noises associated with running the hatchery facilities. These long-term noise impacts are expected to be minor given their anticipated low volume. This minor increase in noise is unlikely to be significant amidst the nearby commercial operations and development in the area.

12.21.5.3 Biological Environment

The Gulf of Mexico is one of the nation's most valuable ecosystems. Florida's barrier islands, estuaries, coral reefs, beaches, seagrass meadows, coastal wetlands, and mangrove forests are world-renowned natural resources and attractions. These habitats provide a range of ecosystem services including fisheries, wildlife-related activities, food production, energy production, infrastructure protection, and recreational opportunities (Gulf Coast Ecosystem Restoration Task Force [GCERTF] 2011). According to the GCERTF (2012), continued coastal habitat loss and degradation in Gulf and estuarine environments along with overfishing has resulted in a declining trend in fish populations, which can threaten ecosystem diversity and stability through food web disruptions.

12.21.5.3.1 **Living Coastal and Marine Resources**

12.21.5.4 Vegetation

Affected Resources

A biological survey for the proposed hatchery property was completed in August 2013 (Wetland Sciences Inc., 2013). The survey report confirmed that the site was on human-made land, created in the early 1900s by placing fill in the bay. The 10-acre site is highly disturbed, and is currently covered with excess material including earth fill and limestone riprap that are stockpiled within the property. Additionally, the site is strewn with other historic debris from previous industrial land uses including creosote-treated timber, concrete pilings, concrete culverts, bricks, abandoned rail spur, and other miscellaneous debris. Three patches of semi-native habitat still existed. These areas constitute only about 1 acre and contain canopies of live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), and cabbage palm (*Sabal palmetto*), with a shrub canopy of wax myrtle (*Myrica cerifera*) and yaupon holly (*Ilex vomitoria*). A number of invasive species were also present, including Chinese tallow (*Triadica sebifera*) and chinaberry (*Melia azedarach*). In addition, the landward side of the mean high water line in the southeast portion of the site contains a fringe wetland consisting of marsh hay (*Spartina patens*). The remainder of the site is dominated by species typical of disturbed landscape in Florida such as lantana (*Lantana camara*), wetland nightshade (*Solanum tampicense*), and, in the wetter zones near the shoreline, torpedo grass (*Panicum repens*), a Category I exotic species. Also located in the project area, adjacent to the proposed construction footprint, is a human-made tidal marsh created for mitigation services.

No federally listed plant species occur in the project area and due to the disturbed nature of the proposed hatchery site and their habitat requirements, it is unlikely that any state-listed plants would occur at the site. No state-listed plant species were observed during the 2013 surveys (Wetland Sciences Inc., 2013).

Environmental Consequences

Most of the project area is highly disturbed; therefore, the proposed project would have no negative impacts to vegetation in this area. Construction activities would cause some disturbance to vegetation in the site's upland habitat. This small area contains remnant native vegetative communities and would be avoided to adhere to city ordinances regarding tree protection. Using construction BMPs to prevent erosion and sediment runoff, disturbance or degradation to these areas would be minimized. Any impacts to native vegetative communities would be short term and minor.

Hatchery development would include a 2-acre plant production and filtration marsh that would enhance the site's vegetation by planting native wetland species, thus producing more habitat diversity than currently exists at the site. In addition, the project would have beneficial impacts to existing upland native vegetation and newly planted wetland species as a result of the removal of exotic plants at the site. The proposed project would, therefore, have a minor, long-term benefit on vegetation resources at the proposed site.

12.21.5.5 Wildlife Habitat

Affected Resources

The proposed project site is significantly disturbed, having been used as a disposal site for solid waste debris such as concrete pilings, bricks, culverts, creosote logs, and abandoned rail spur. Three small wooded areas are located on the eastern portions of the site that may provide habitat for small urban mammals and birds. Human-made tidal marshes to the south and east of the construction footprint provide habitat for marsh birds, wading birds, and possibly wintering waterfowl. In the southeast portion of the site, a small natural beachfront provides habitat to foraging shorebirds and wading birds. No bird rookeries or other nests were observed during surveys of the site.

Environmental Consequences

Common urban wildlife of the site and their respective habitat would face a short-term, minor impact during construction from noise produced by construction equipment, as well as minor, long-term impacts due to habitat loss where the hatchery facility footprint would be placed. There would be a short-term, minor impact to nearby human-made tidal marshes and beachfront habitat because wildlife using these habitats could experience disturbance during construction due to noise. The proposed project's plant production and filtration marsh would enhance the site by producing 2 additional acres of marsh habitat in the area, resulting in a long-term, moderate beneficial impact to species that use this type of habitat.

12.21.5.6 Marine and Estuarine Fauna

Affected Resources

More than 200 species of fish and shellfish have been identified in the Pensacola Bay estuary. Common fish and shellfish species are spot (*Leiostomus xanthurus*), bay anchovy (*Anchoa mitchilli*), Atlantic croaker (*Micropogonias undulates*), spotted seatrout, Gulf menhaden (*Brevoortia patronus*), striped mullet (*Mugil cephalus*), blue crab *(Callinectes sapidus)*, American oyster (*Crassotrea virginica*), and Penaeid shrimp *(Penaeus* spp.). Freshwater fish species that are tolerant of low salinities use embayments and marshes. These include largemouth bass (*Micropterus salmoides*) and redear sunfish (*Lepomis microlophus*). Four anadromous fish—gulf sturgeon, Alabama shad (*Alosa alabamae*), skipjack herring (*Alosa hrysochloris*), and striped bass (*Morone saxatilis*)—use the bay and its tributaries (FDEP 2004).

Environmental Consequences

No negative impacts to coastal and marine resources are expected from the development of the proposed hatchery. Assuming accurate analysis of the genetic risks (FWC 2009a), the release of Phase I hatchery fish would have a long-term benefit on estuarine and marine resources by supplementing

native populations of three fish species. The success of the hatchery releases would be determined by an ongoing comprehensive monitoring program. Specific objectives of this monitoring program would be to estimate the short- and long-term survival of stocked fish; the potential long-term impact on wild sport fish populations; and the respective contributions of hatchery fish to local fish populations and recreational catches. Methods that may be implemented as part of a multidisciplinary and integrative monitoring program to evaluate hatchery program success are described below:

1. **Hatchery Production.** Staff at the hatchery would collect and maintain a captive sport fish brood stock; produce hatchling sport fish and rear them to the appropriate size for release; mark larger fish with coded wire tags (CWT); and participate in fish releases.
2. **Fish Health.** Staff would work with a suite of qualified partners to evaluate the health of all hatchery-reared offspring before release. Post-release surveys would also be used assess the survival and health status of hatchery-reared sport fish.
3. **Fisheries-Dependent Monitoring (FDM).** Recreational anglers would be surveyed to monitor fishing effort, catch and other variables such as targeted species. Fin clips from harvested sport fish would also be obtained for genetic testing.
4. **Fisheries-Independent Monitoring (FIM).** Staff would systematically collect sport fish of all sizes from estuarine and coastal waters via stratified random sampling and directed fishing using small mesh seines, trammel nets, and hook-and-line. Fish would be scanned by an onboard detector for the presence of CWTs and fin clips, or other tissue would be collected for genetic testing. Fish collected with CWT would be retained. Other fish would be measured and released; those greater 100 millimeters (standard length) would be fin-clipped.
5. **Angler-based Fin Clip Program (FCP).** Staff would develop a volunteer-based fin-clip program to identify hatchery-released fish. Recreational anglers would be provided with kits to collect fin clips and record collection data.
6. **Radio Telemetry.** A number of larger fish would be tagged with transmitters to identify patterns of movement and habitat preferences of released fish.

12.21.5.7 Protected Species

Affected Resources

The Trusteeshave reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS. For this, the Trusteesfirst reviewed the species list for Escambia County, Florida[29]. Table 12-49 presents a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

[29] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

Table 12-49. Potential Impacts to Species/Critical Habitats managed by USFWS.

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
West Indian manatee	The county in the project area is not part of the 36 Florida counties that are identified as being counties where manatees regularly occur in coastal and inland waters (U.S. Department of the Interior, 2011). Though manatees are not commonly known from the action area, manatees could be present in the project waters (U.S. Department of the Interior, 2011). The main risk to manatees during execution of this project would come from pier construction and operation of an in-take pipe which could result in harm or mortality.
Gulf sturgeon	NMFS was consulted on Gulf sturgeon and its Critical Habitat in the estuarine environment. As a result, Gulf Sturgeon was not considered in the consultation with the USFWS.

In addition to the protected species managed by USFWS, the Trustees reviewed the proposed projects and associated actions for potential impacts to the following protected species (status indicated) and their associated critical habitat, if appropriate, managed by NMFS:

- Gulf Sturgeon, *Acipenser oxyrinchus desotoi*, Threatened
- Smalltooth Sawfish, *Pristis pectinata,* Endangered
- Green Sea Turtle, *Chelonia mydas*, Endangered
- Loggerhead Sea Turtle, *Caretta caretta*, Threatened
- Hawksbill Sea Turtle, *Eretmochelys imbricata*, Endangered
- Leatherback Sea Turtle, *Dermochelys coriacea*, Endangered
- Kemp's Ridley Sea Turtle, *Lepidochelys kempii*, Endangered.

Additional information on some of these species is provided below.

Sea Turtles and Marine Mammals

There are five species of endangered or threatened sea turtles that may occur or have the potential to occur in the project area. These include green turtle, hawksbill turtle, Kemp's ridley turtle, leatherback turtle, and loggerhead turtle. Sea turtles forage in the waters of the coastal Florida panhandle region and have the potential to occur in the waters where in-water work is proposed. The project site does not contain potentially suitable sea turtle nesting habitat.

The endangered West Indian manatee has the potential to occur in the project area waters. Manatees typically seek out shallow seagrass areas as preferred feeding habitat (USFWS 2010). Additionally, bottlenose dolphin (*Tursiops* spp.) populations are known to migrate into bays, estuaries, and river mouths and could be located in the proposed project area (NMFS 2013b).

Gulf Sturgeon and Gulf Sturgeon Critical Habitat

Gulf sturgeon are restricted to the Gulf of Mexico and its drainages, occurring primarily from the Pearl River in Louisiana to the Suwannee River, in Florida (NMFS 2009). Adult fish reside in rivers for 8 to 9 months each year and in estuarine or Gulf of Mexico waters during the 3 to 4 cooler months of each year (NMFS 2009). Important marine habitats include seagrass beds with sand and mud substrates (Mason and Clugston 1993).

Gulf sturgeon critical habitat was jointly designated by the NMFS and USFWS on April 18, 2003 (50 C.F.R. 226.214). The proposed project site is located within the Florida Nearshore Gulf of Mexico Critical Habitat Unit 9 – Pensacola Bay, which contains winter feeding and migration habitat for Gulf sturgeon. Critical habitat was designated based on seven primary constituent elements (PCEs) essential for its conservation, as defined in the 2003 *Federal Register*.The seven elements of critical habitat are listed below. The project site contains PCE's 1, 5, 6, and 7.

1. Abundant food items, such as detritus, aquatic insects, worms, and/or mollusks, within riverine habitats for larval and juvenile life stages; and abundant prey items, such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks, and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages;
2. Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
3. Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths; these are believed necessary for minimizing energy expenditure during freshwater residency and possibly for osmoregulatory functions;
4. A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging;
5. Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages;
6. Sediment quality, including texture and chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and
7. Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., an unobstructed river or a dammed river that still allows for passage).

Gulf sturgeon critical habitat in the area of the proposed hatchery is shown inFigure 12-44.

Figure 12-44. Gulf Sturgeon critical habitat in the project area vicinity.

Essential Fish Habitat

EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. The EFH within the project area include emergent wetlands, mud substrate, and estuarine water columns for species of fish, such as red drum, brown shrimp, pink shrimp, and white shrimp. There are no marine components of EFH in the vicinity of the project site.

Table 12-50 provides a list of the species that NMFS manages under the federally Implemented Fishery Management Plan in the vicinity of the Florida Gulf Coast Marine Fish Hatcheries/Enhancement Center site and Pensacola Bay.

Table 12-50. Federally managed fisheries with designated Essential Fish Habitat (EFH) in the proposed project area. .

EFH_Category	Species
Atlantic Highly Migratory Species	Atlantic Sharpnose Shark-Neonate
	Sandbar Shark-Neonate
	Scalloped Hammerhead Shark-Neonate
	Tiger Shark-Juvenile
	Tiger Shark-Neonate
Coastal Migratory Pelagics of the Gulf of Mexico AND South Atlantic	Cobia
	King Mackerel
	Spanish Mackerel
Gulf of Mexico Red Drum	Red Drum
Gulf of Mexico Shrimp	Brown Shrimp
	Pink Shrimp
	White Shrimp
Reef Fish Resources of the Gulf of Mexico	Almaco Jack
	Banded Rudderfish
	Black Grouper
	Blackfin Snapper
	Blueline Tilefish
	Cubera Snapper
	Gag
	Goldface Tilefish
	Gray (Mangrove) Snapper
	Gray Triggerfish
	Greater Amberjack
	Hogfish

EFH_Category	Species
	Lane Snapper
	Lesser Amberjack
	Mutton Snapper
	Nassau Grouper
	Queen Snapper
	Red Grouper
	Red Snapper
	Scamp
	Silk Snapper
	Snowy Grouper
	Speckled Hind
	Tilefish
	Vermilion Snapper
	Warsaw Grouper
	Wenchman
	Yellowedge Grouper
	Yellowfin Grouper
	Yellowmouth Grouper

State-Listed Birds, MBTA and BGEPA

There are more than 400 species of migratory birds, and hundreds of thousands of individuals reside along the Gulf Coast during the winter to forage and rest, while others are present during the summer to breed. All migratory bird species are protected under the MBTA. There are numerous state of Florida–listed bird species with potential for occurrence in and around the proposed hatchery site. These include Arctic peregrine falcon (*Falco peregrinus tundrius*), least tern (*Sterna antillarum*), southeastern American kestrel (*Falco sparverius paulus*), American oystercatcher (*Haematopus palliates*), and southeastern/Cuban snowy plover (*Charadrius alexandrinus tenuirostris*). The nesting season in Florida is from February 15 to August 13. Migratory birds may be foraging and resting in terrestrial or aquatic habitats on site. However nesting is only likely by songbirds in the large trees on site (USFWS 2013a).

The annual statewide survey of known bald eagle nesting territories in Florida conducted between November and March by the FWC indicates that there are 3 eagle nests within Escambia County. Of these, one is approximately 5 miles west of the site and the other two are more than 5 miles from the site (FWC 2013c).

The proposed project was also reviewed for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), respectively. Table 12-51 provides a summary of the different migratory bird groups specifically addressed by this review and summarizes the potential

impacts to these groups and associated habitats that could result from the implementation of this project.

Table 12-51. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Songbirds, wading birds, marsh birds	Foraging, resting, nesting	Migratory birds may be foraging and resting in terrestrial or aquatic habitats on site. However the only nesting would likely would be songbird nesting in the large trees on site.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in Table 12-52.

Table 12-52. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Nesting songbirds	The large oak and pecan trees on site will be avoided during site grading and project construction.
Resting and feeding birds	Care will be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbances will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project will occur during daylight hours only.

Environmental Consequences

The proposed project has been evaluated for potential short- and long-term impacts to state and federally protectedspecies that may occur in and adjacent to the project area based on available suitable habitat and restoration goals. Descriptions of these evaluations are provided below.

Protected Species

An initial biological site survey in 2013 (Wetland Sciences, Inc., 2013) concluded that no state or federally listed species or critical habitatare present in the terrestrial habitats of the project area.

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On December 23, 2013 the review of potential impacts to species managed by USFWS was completed (McClain, 2013). The USFWS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect West Indian manatee.

The consultation of potential impacts on protected species managed by NMFS was initiated on January 30, 2014. The Trustees'review of the potential impacts of the project for protected species managed by NMFS determined the proposed action "may affect, but is not likely to adversely affect" the following species and associated critical habitats in the project implementation area:

- Gulf Sturgeon - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.

- Gulf Sturgeon Critical Habitat – The project footprint does fall within Gulf sturgeon critical habitat (Critical Habitat Unit 9 – Pensacola Bay); however, the construction activities associated with this project will not adversely modify designated Gulf sturgeon critical habitat.
- Smalltooth Sawfish – The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Green Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Loggerhead Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Hawksbill Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Leatherback Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Kemp's Ridley Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- A formal concurrence from NMFS with the Trustees'conclusions for these species and associated critical habitats is still pending.
- A formal concurrence from NMFS with the Trustees'conclusions for these species and associated critical habitats is still pending.

A concurrence from NMFS with the Trustees'conclusions for these species and associated critical habitats is still pending.

The Trustees also evaluated the potential for take of Marine Mammals under the MMPA and due to these species' mobility and the implementation of NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006), *Standard Manatee Conditions for In-Water Work* (USFWS 2011), and USFWS recommended conservation measures for listed species and other trust resources, take of marine mammals under the MMPA is not anticipated.

Essential Fish Habitat

With the development of the seawater withdrawal structure the Trustees determined there could be habitat conversion of EFH on a limited scale. However, the Trusteesalso determined the hatchery development would likely improve water quality returning to Pensacola Bay relative to current conditions, thereby benefiting EFH.

On April 24, 2014 NMFS completed its evaluation of potential EFH impacts and concurred with the Trustees'determination that the proposed project could lead to a limited habitat conversion of EFH but that the overall development of the hatchery site, including stormwater management and treatment, would likely improve water quality returning to Pensacola Bay relative to current conditions (Fay, 2014)

State-Listed Birds, MBTA and BGEPA

The closest known bald eagle nest is approximately 5 miles from the project site. Based on the distance from proposed project activities, nesting of the known bald eagles would not be impacted. At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

12.21.5.8 Human Uses and Socioeconomics

12.21.5.8.1 Socioeconomics and Environmental Justice

Affected Resources

The hatchery would be developed in an urban industrial area within the city of Pensacola, Florida. The proposed hatchery project site is currently undeveloped and does not support any economic activity or human use. The area surrounding the site is industrial. No residential areas that might contain low-income or minority communities are present.

Florida is America's most popular sport fishing destination, contributing $5 billion annually to the state's economy (FMFEI 2013). The closures of beaches and fishing access points following the oil spill resulted in declining revenues from license and tackle sales and tourism associated with recreational fishing. Revenue from commercial fishing also declined following the Spill. According to USFWS's Wildlife & Sport Fish Restoration Program estimates, in 2006 the recreational saltwater fisheries industry in Florida supported an estimated 54,000 jobs with an overall economic impact estimated at $5.7 billion.

Table 12-53 provides a summary of population data and characteristics of the population of Escambia County and compares it to those same measures for the population of the state as a whole.

Table 12-53. Population characteristics for Escambia County and the State of Florida.

PEOPLE QUICKFACTS	ESCAMBIA COUNTY	FLORIDA
Population, 2012 estimate	302,715	19,317,568
Persons under 5 years, percent, 2012	6.20%	5.50%
Persons under 18 years, percent, 2012	21.10%	20.70%
Persons 65 years and over, percent, 2012	15.20%	18.20%
Female persons, percent, 2012	50.50%	51.10%
White alone, percent, 2012 (a)	70.10%	78.30%
Black or African American alone, percent, 2012 (a)	22.90%	16.60%
American Indian and Alaska Native alone, percent, 2012 (a)	0.90%	0.50%
Asian alone, percent, 2012 (a)	2.90%	2.70%
Native Hawaiian and Other Pacific Islander alone, percent, 2012 (a)	0.20%	0.10%
Two or more races, percent, 2012	3.00%	1.90%
Hispanic or Latino, percent, 2012 (b)	5.10%	23.20%
White alone, not Hispanic or Latino, percent, 2012	66.00%	57.00%
Homeownership rate, 2007–2011	67.30%	69.00%

PEOPLE QUICKFACTS	ESCAMBIA COUNTY	FLORIDA
Median household income, 2007–2011	$43,707	$47,827
Persons below poverty level, percent, 2007–2011	16.90%	14.70%
Manufacturer's shipments, 2007 ($1,000)	2,117,030	104,832,907
Merchant wholesaler sales, 2007 ($1,000)	1,838,916	221,641,518

Source: U.S. Census Bureau State & County QuickFacts (U.S. Census Bureau 2013)
(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, so also are included in applicable race categories.

Environmental justice refers to the fair and equitable treatment of individuals regardless of race, ethnicity, or income level, in the development and implementation of environmental management policies and actions. In February 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low Income Populations. The objective of this executive order is to require each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental impacts of its programs, policies, and activities on minority and low income populations."

Environmental Consequences

The hatchery project would have no negative impacts on the socioeconomic status of the city and Escambia County. The proposed project would not adversely affect any low-income or minority populations.

The proposed project would create approximately 1,912 worker days of employment during construction (Table 12-47). Engineering and design work could employ 20 to 30 federal and state employees and consultants for up to 2 years. The construction crew could consist of 20 to 30 people who would be employed for a period of 9 to 18 months. Maintenance activities may employ up to 10 people for less than 6 months. Minor, short-term, beneficial impacts would occur from increased employment during project construction.

Minor, beneficial economic impacts would accrue to local restaurants and hospitality providers. Operation of the hatchery would result in the hiring of 9 to 15 additional FWC staff. Additional benefits to the local economy would occur from the purchase of local goods and services through the estimated $1 million envisioned for supporting the facility's annual operations and maintenance budget. Local businesses would benefit from 9 to 15 additional employees and an unknown number of hatchery visitors as potential customers.

Operation of the hatchery would produce nearly 5 million juvenile fish for release in the bay. These fish would contribute to restoring a vibrant saltwater fishery to support expanded fishing interests. The resulting increase in license and tackle sales and tourism dollars would have a long-term, moderate, beneficial effect on the local and statewide economy.

The project would not create a benefit for any specific group or individual, but rather would produce benefits realized by the local community and visitors. There are no indications that the public improvements would be contrary to the goals of Executive Order 12898 or would create

disproportionate, adverse human health or environmental impacts on minority or low-income populations of the surrounding community. Therefore no environmental justice issues would be anticipated in the short term or long term.

12.21.5.8.2 Cultural Resources

Affected Resources

A review of the Florida Master Site files indicates that there are at least 14 previously recorded archaeological sites or historic standing structures located within 1 mile of the project area. These include prehistoric and historic-era sites as well as at least three shipwrecks/ballast dumps in the water surrounding the project area. Sites 8ES1963 (a nineteenth to twentieth century scatter) and 8ES2384 (a Spanish-era fort) are located in the immediate vicinity of the project area. Site 8ES1963 has no determination of eligibility for the National Register of Historic Places (NRHP); site 8ES2384 was recommended as potentially eligible for listing on the NRHP.

In addition, a beach and associated bathhouse were formally located on the site and used by African Americans during segregation in the first part of the 20th century. No existing infrastructure associated with this use remains on the site, however, the project proponents have had extensive discussion with community leaders and plan to develop educational signage documenting this historical use.

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area .

Environmental Consequences

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

12.21.5.8.3 Infrastructure

Affected Resources

The proposed hatchery site is currently a vacant lot zoned for commercial use within the city of Pensacola. The site is surrounded by commercial and industrial facilities. There are no active utility connections present.

Environmental Consequences

Site development would require utility connections. Permits would be obtained and all associated use conditions would be adhered to. Utility connections are consistent with the nature of the surrounding area and would not be expected to pose service problems for the relevant utilities (e.g., electricity, wastewater, refuse). Specifically, the low volume of biological waste (i.e., fish feces, undigested food) that would be generated from the hatchery operations would be disposed of through a permitted

wastewater service provided by Emerald Coast Utilities Authority. As a result, no adverse impact to infrastructure would be expected from the development of the hatchery.

12.21.5.8.4 Land and Marine Management

Affected Resources

The proposed hatchery project site is a vacant lot in an urban, industrial area zoned for commercial use in the city of Pensacola. The surrounding properties support industrial and commercial buildings.

Environmental Consequences

The hatchery project would not adversely affect land and marine management in the short or long term and is consistent with existing land use and regional resource management plans. Development of the hatchery would be consistent with the FWC's existing marine fishery support goals as expressed in the FMFEI and the development of an operation supporting economic activity based on the commercial zoning of the lot.

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS. The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process.

12.21.5.8.5 Aesthetics and Visual Resources

Affected Resources

The proposed site is currently a vacant lot in a developed urban area that is filled with debris. Small patches of trees provide some aesthetic value. The lot is located on Main Street and is visible to local motorists. One commercial establishment, Nick's Boathouse, has outdoor seating, some of which may be oriented toward the project site. However, most of the tables are situated to provide customers with a view of the bay.

Environmental Consequences

Development of the hatchery would have a minor, short-term impact on aesthetics and visual resources during construction when equipment and activity may be seen by passing motorists. A minor, long-term reduction in visual and aesthetic resources is likely for motorists or customers at Nick's Boathouse with the construction of the hatchery building. However, given the industrial atmosphere surrounding the site, it is unlikely that the aesthetic resources of motorists passing by on Main Street would be affected by the hatchery building. A minor, long-term improvement of visual resources would occur as a result of the removal of the debris currently on-site and the development of additional ponds and wetlands.

12.21.5.8.6 Tourism and Recreational Use

Affected Resources

The site does not currently support any official tourism or recreational use. The adjacent mitigation wetlands may provide bird-watching opportunities.

Environmental Consequences

The development of the hatchery would not negatively affect tourism and recreational use in the area. Some minor long-term benefit would occur through visitation to the facility. In the long term, the ultimate goal of the hatchery project is to release fish that would support recreational fishing activity in Florida. Should the hatchery be successful in supplementing saltwater fish populations, the result would be a long-term, beneficial impact to tourism by anglers who are attracted to Florida by the fishing opportunities.

FWC does not include an evaluation of how the development of the hatchery and subsequent release of hatchery fish affects recreational angling in the state as part of their monitoring program. Anecdotal evidence from the Tampa Bay fishery, which receives fish from SERF's operations, suggests recreational anglers are aware of hatchery releases and may target their recreation to receiving waters. If the hatchery operations result in maintaining or increasing fish stocks, recreational fishing would receive a minor, long-term benefit.

12.21.5.8.7 Public Health and Safety and Shoreline Protection

Affected Resources

The site is on vacant land in a developed urban and industrial area of Pensacola, Florida. The shoreline in this section of the bay has been extensively modified by past human activity, including armoring, to protect local habitat restoration. The project would be separated from the current shoreline by existing wetland mitigation areas and future stormwater and filtration ponds.

Environmental Consequences

Project development would require use of mechanical equipment that uses oil, lubricants, and fuels. The contractor would be required to take appropriate actions to prevent, minimize, and control the spill of construction-related hazardous materials such as vehicle fuels, oil, hydraulic fluid, and other vehicle maintenance fluids and to avoid releases and spills. If a release should occur, such releases would be contained and cleaned up promptly in accordance with all applicable regulations. As a result, no impacts associated with construction-related hazardous materials would be anticipated.

The hatchery would not affect public health as long as relevant waste disposal guidelines and regulations are followed. The hatchery would be built in an upland area away from the shoreline and would not require any modifications to the shoreline. It is not clear exactly what the debris currently on the site consists of, but the presence of metals, railway timbers, and concrete could pose a health risk to the local public. Removal of this debris would have a minor, short-term beneficial effect on public health and safety. No short- or long-term negative impacts to public health and safety or shoreline protection would be expected.

12.21.6 Summary and Next Steps

The proposed Florida Gulf Coast Marine Fisheries Hatchery/Enhancement Center project would involve constructing and operating a saltwater sportfish hatchery in Pensacola, Florida. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would enhance and/or increase recreational fishing opportunities by producing and releasing highly sought-after sportfish species. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

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12.22 Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle: Project Description

12.22.1 Project Summary

The proposed Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle project would involve enhancing local scallop populations in targeted areas in the Florida Panhandle. The proposed improvements include the harvesting and redistribution of naturally-occurring juvenile scallops supplemented with stocking from a commercial scallop hatchery. The total estimated cost for this project is $2,890,250.

12.22.2 Background and Project Description

The Trustees propose to use restoration methods previously developed and implemented by the Florida Fish and Wildlife Conservation Commission to enhance bay scallop (*Argopecten irradians*) populations in the bays of Florida's Panhandle (see Figure 12-45 for potential project locations)).

In Florida, recreational scalloping has a long cultural heritage that particularly encourages multigenerational family interaction. Recreational harvest is currently legal in the waters of the eastern panhandle through the Big Bend region (from Gulf County through Hernando County). Harvest has been closed in the western Florida Panhandle (Bay County west of the Mexico Beach Canal through Escambia County) since 2002 (commercial harvest has also been prohibited statewide since 1994).

The objective of the proposed Scallop Enhancement project is to enhance and/or increase recreational fishing opportunities by increasing scallop populations. The restoration work proposed includes enhancing local scallop populations in targeted areas through a combination of the harvest and redistribution of naturally-occurring juvenile scallops supplemented with stocking from a commercial scallop hatchery. Implementing this project would increase scallop populations in the targeted locations to self-sustaining levels that would support recreational harvests within 3-5 years in Bay County (St. Andrew Bay system) and within 10 years in Escambia and Santa Rosa Counties (Pensacola Bay / Santa Rosa Sound) and possibly Okaloosa and Walton Counties. Scallop populations in Gulf and Franklin Counties may also be targeted for enhancement if it is deemed appropriate in order to reduce the risk of population collapses in current recreationally harvested areas.

12.22.3 Evaluation Criteria

This proposed project meets the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and related response actions, the public's access to and enjoyment of the natural resources along Florida's Panhandle was denied or severely restricted. The proposed Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle project is intended to enhance and/or increase recreational fishing opportunities by increasing scallop populations. The project would enhance and/or increase opportunities for the public's use and enjoyment of the natural resources, helping to offset adverse impacts to such uses caused by the Spill and related response activities. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

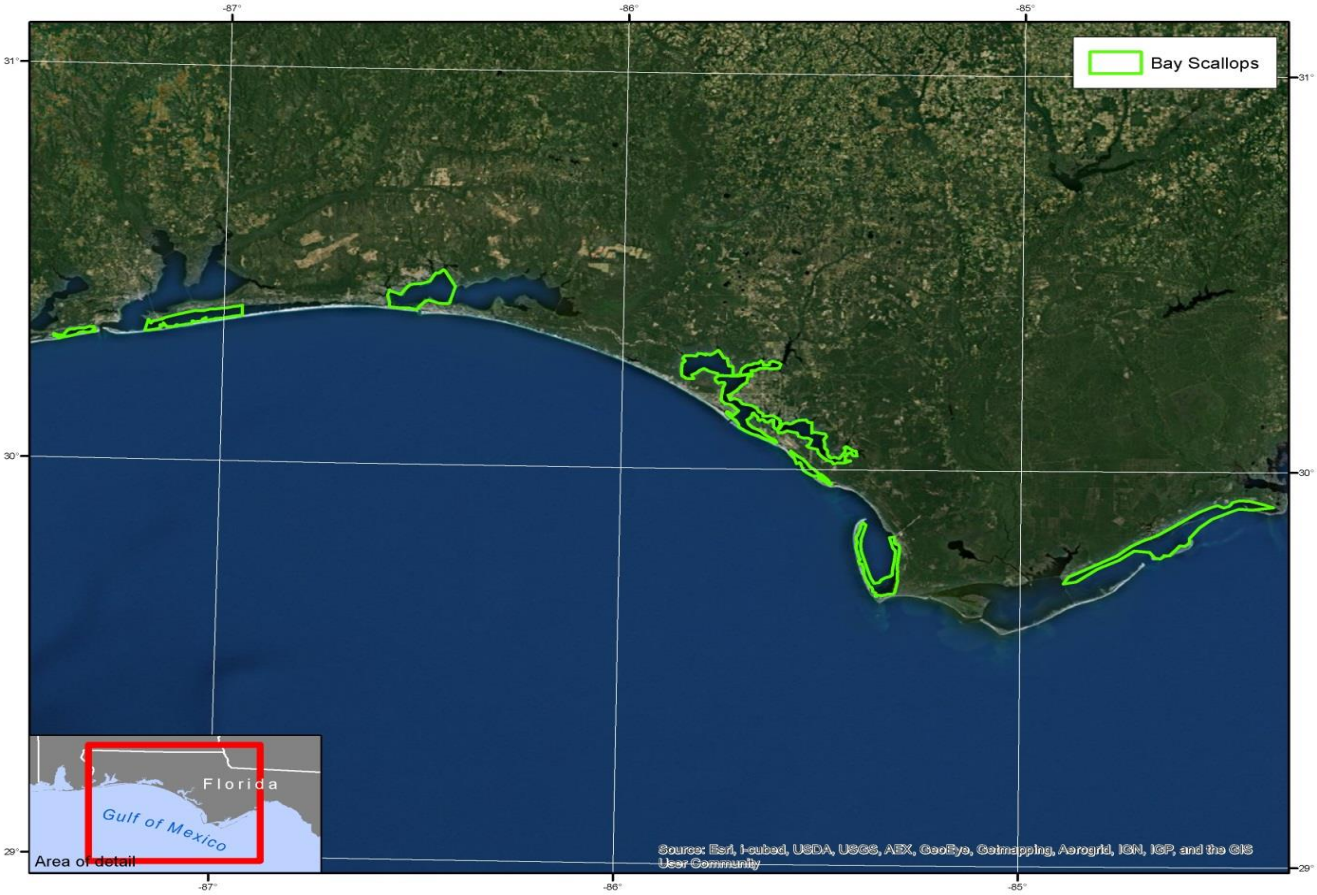

Figure 12-45. Location of Potential Locations for Activity as part of the Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle Project.

The project is technically feasible and utilizes proven techniques with established methods and documented results and can be implemented with minimal delay. Government agencies have successfully implemented similar projects in the region. The State of Florida has successfully enhanced scallop populations in other bays in the state. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Furthermore, the cost estimates are based on similar past projects and therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.22, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.22 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). This proposed project is not anticipated to negatively affect regional ecological restoration and is therefore not inconsistent with the long-term restoration needs of the State of Florida. See Sections 6d of the Framework Agreement.

Many recreational use projects, including ones similar to this project, have been submitted as restoration projects on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com).

In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle project also meets the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by response and SCAT activities for the Spill.

12.22.4 Performance Criteria, Monitoring and Maintenance

As part of the project cost, monitoring will be conducted to ensure project plans and designs were correctly implemented. Monitoring has been designed around the project goals and objectives. The project objective is to enhance and/or increase recreational fishing opportunities by increasing the local scallop populations in targeted areas. Performance monitoring will evaluate the number of spat per unit area in newly stocked regions of Wakulla, Gulf, Franklin, Walton, Okaloosa, Santa Rosa, and Escambia counties. Specific success criteria include: increased likelihood that the scallop population density is increased to and sustained at recreational harvesting levels.

The monitoring will occur for the life of the project, which is ten years. These assessments will be conducted by FWC under established protocols. Long term maintenance activities include annual procurement of larvae and spat from a commercial shellfish hatchery and monthly harvest and rearing of naturally occurring scallop spat to supplement collapsed or transitional populations.

Recreational use on scallop areas open to harvest will be assessed using both boat counts (aerial or boat-based) and a shore-based survey of scallopers currently used by FWC. This assessment will occur at least once during the three month recreational harvesting season. The recreational use numbers will be provided to the Florida Department of Environmental Protection.

12.22.5 Offsets

The Trustees and BP negotiated a BCR of 2.0 for the proposed recreational use project. NRD Offsets are $5,780,500 expressed in present value 2013 dollars to be applied against the monetized value of lost recreational use provided by natural resources injured in Florida, which will be determined by the Trustees' assessment of lost recreational use for the Oil Spill. Please see Chapter 7 of this document (Section 7.2.2) for a description of the methodology used to develop monetized Offsets.[30]

[30] For the purposes of applying the NRD Offsets to the calculation of injury after the Trustees' assessment of lost recreational use for the Spill, the Trustees and BP agree as follows:

- The Trustees agree to restate the NRD Offsets in the present value year used in the Trustees' assessment of lost recreational use for the Spill.
- The discount rate and method used to restate the present value of the NRD Offsets will be the same as that used to express the present value of the damages.

12.22.6 Cost

The total estimated cost to implement this project is $2,890,250. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for construction, monitoring, and contingencies.

12.23 Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle: Environmental Review

The purpose of this project is to enhance local bay scallop (*Argopecten irradians*) populations in targeted bays of Florida's panhandle. As part of the project, scallops could be released to enhance the natural populations in Bay, Escambia, Gulf, Franklin, Okaloosa, Santa Rosa, and Walton Counties. The proposed improvements include the harvesting and redistribution of naturally occurring juvenile scallops supplemented with stocking from a commercial scallop hatchery.

12.23.1 Introduction and Background

In April 2011, the Natural Resource Trustees (Trustees) and BP Exploration and Production, Inc. (BP) entered into the Framework Agreement for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is underway. The Framework Agreement is intended to expedite the start of restoration in the Gulf Coast in advance of the completion of the injury assessment process. Early Restoration is not intended to and does not fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects would be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement, the Trustees released, after public review of a draft, a Phase I Early Restoration Plan (ERP) in April 2012. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, the National Oceanic and Atmospheric Administration (NOAA) issued a public notice in the *Federal Register* on behalf of the Trustees announcing the development of additional future Early Restoration projects for a Draft Phase III Early Restoration Plan (ERP). This scallop enhancement project was submitted as an Early Restoration project on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida. In addition to meeting the evaluation criteria for the Framework Agreement and the requirements of the Oil Pollution Act (OPA), the project meets Florida criteria that Early Restoration projects occur in the eight-county panhandle area that deployed boom and was impacted by the Spill.

The Trustees propose to use restoration methods previously developed and implemented by the Florida Fish and Wildlife Conservation Commission (FWC) to enhance bay scallop populations in the bays of Florida's panhandle.

In Florida, recreational scalloping has a long cultural heritage that particularly encourages multigenerational family interaction. Recreational harvest is currently legal in the waters of the eastern panhandle through the Big Bend region (from Gulf County through Hernando County). Harvest has been closed in the western Florida panhandle (Bay County west of the Mexico Beach Canal through Escambia County) since 2002 (commercial harvest has also been prohibited statewide since 1994).

The objective of the proposed Scallop Enhancement project is to enhance and/or increase recreational fishing opportunities by increasing scallop populations.

Implementing this project would increase scallop populations in the targeted locations to self-sustaining levels that would support recreational harvests within 3–5 years in Bay County (St. Andrew Bay system) and within 10 years in Escambia and Santa Rosa Counties (Pensacola Bay/Santa Rosa Sound) and possibly Okaloosa and Walton Counties. Scallop populations in Gulf and Franklin Counties may also be targeted for enhancement if such is deemed appropriate to reduce the risk of population collapses in current recreationally harvested areas.

12.23.2 Project Location

Scallop enhancement actions would be completed in state waters of Escambia, Santa Rosa, Okaloosa, Bay, Gulf, and Franklin Counties. Waterbodies where scallop enhancement activities are planned include Big Lagoon; Santa Rosa Sound, including portions of Fort Pickens Aquatic Preserve; Choctawhatchee Sound (if appropriate habitat can be located); St. Andrews Bay system, including portions of St. Andrews Aquatic Preserve; St. Joseph Bay, including portions of St. Joseph Bay Aquatic Preserve; and coastal Gulf of Mexico, including a portion of Alligator Harbor Aquatic Preserve. The scallop enhancement activities would target any appropriate seagrass habitat where the population does not appear to be self-sustaining, as determined through monitoring activities. Figure 12-46 illustrates the areas where scallop enhancement activities are planned.

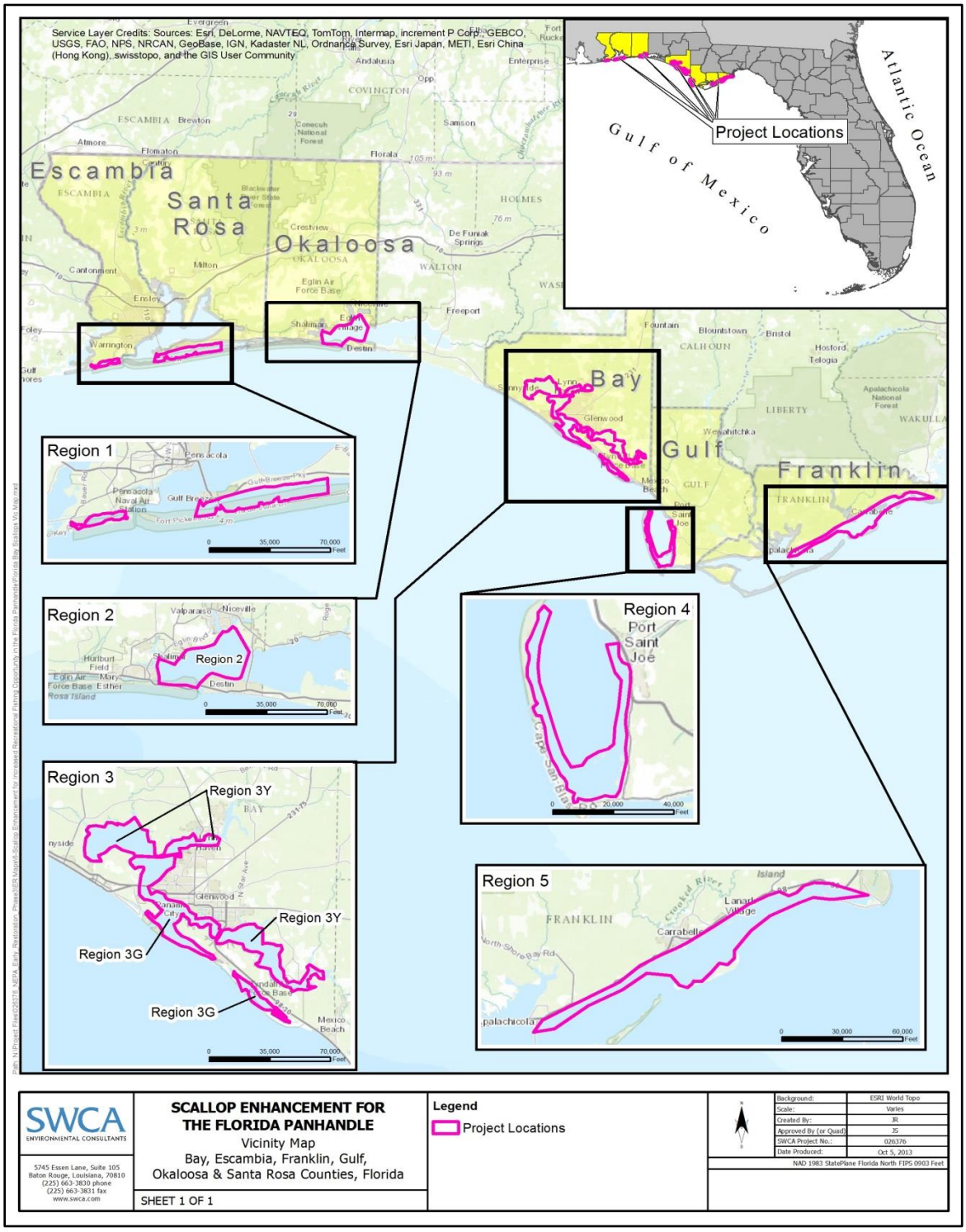

Figure 12-46. Areas where bay scallop enhancement actions are planned.

12.23.3 Construction and Installation

The proposed Scallop Enhancement project involves enhancing local scallop populations in targeted areas through a combination of the collection and redistribution of naturally-occurring juvenile scallops, potentially supplemented with the stocking of juvenile scallops obtained from a commercial scallop hatchery if not enough are collected from the environment. This approach incorporates restoration methods previously developed by the Florida Fish and Wildlife Conservation Commission (FWC) to enhance bay scallop (*Argopecten irradians*) populations in the bays of Florida's Panhandle.

Specifically, the project would enhance local scallop populations in targeted areas (see Figure 12-46 for potential project locations) through a combination of the collection and redistribution of naturally-occurring juvenile scallops, referred to as spat, supplemented, if needed, with stocking from a commercial scallop hatchery. This collection and redistribution activity would take place year-round, consistent with existing scallop monitoring activities, as the timing of spawning peaks remains largely uncertain.

Figure 12-47 provides an example of a typical spat collection device being deployed. This device is typically constructed out of a collection bag with a float, to keep it near the surface, anchored to a ½ cinderblock by a length of line generally 6-12 ft long. Spat collected using this device would subsequently be released into the targeted bays from small workboats (e.g., similar in size to the one pictured inFigure 12-47) by pouring out a mixture of the spat and seawater into the receiving bay from holding containers (e.g., 5 gallon pails).

To date, with more than 20 years of experience operating these monitoring and collection devices, there is no record of species entanglement. To further reduce risks and help avoid in-water impacts to protected species, the recommendations for in-water work within the *Sea Turtle and Smalltooth Sawfish Construction Conditions* guidance (NOAA, 2006) would be adhered to.

Figure 12-47. A typical spat collection device being deployed.

Restoration activities would be ongoing more than 10 years. The amount of time spent at each individual project location would be relatively brief—lasting as long as required to release bay scallop spat and collect any necessary monitoring data—but each site would be visited regularly throughout the 10-year project period. Snorkelers and/or scuba divers would swim transects at each site to monitor scallop reestablishment.

12.23.4 Operations and Maintenance

As part of the project, monitoring would be conducted to ensure project plans and designs are correctly implemented. Monitoring has been designed around the project goals and objectives. The project objective is to enhance and/or improve the public's use and/or enjoyment of the natural resources by increasing the local scallop populations in targeted areas. Performance monitoring would evaluate the number of spat per unit area in newly stocked regions of the project areas. Specific success criteria include greater likelihood that the scallop population density is increased to and sustained at recreational harvesting levels.

The monitoring would occur for the life of the project, which is 10 years. These assessments would be conducted by the FWC under established protocols. Long-term maintenance activities include annual procurement of larvae and spat from a commercial shellfish hatchery, and monthly harvest and rearing of naturally occurring scallop spat to supplement collapsed or transitional populations.

Recreational use on scallop areas open to harvest would be assessed using both boat counts (aerial or boat-based) and a shore-based survey of scallopers currently used by FWC. This assessment would occur at least once during the 3-month recreational harvesting season. The recreational use numbers would be provided to the Florida Department of Environmental Protection (FDEP).

12.23.5 Affected Environment and Environmental Consequences

Under the National Environmental Policy Act, federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. The following sections describe the affected resources and environmental consequences of the project.

12.23.5.1 No action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

Under No Action, the existing conditions described for the project site in the affected environment subsection would prevail. Restoration benefits associated with this project would not be achieved at this time.

12.23.5.2 Physical Environment

12.23.5.2.1 Geology and Substrates

Affected Resources

The existing geology and substrates in bay scallop enhancement areas are generally flat or gently sloping sandy/silty beaches in an estuarine system. The estuarine embayments are within the Gulf Coastal

Lowlands subdivision. The lowlands are a series of parallel terraces rising from the coast in successively higher levels (Scott 2001). They formed during the Pleistocene Epoch (Great Ice Age) when fluctuating sea levels were associated with the growth and melting of ice caps. Dunes, barrier islands, beach ridges, and other topographical features were stranded inland as seas receded. Currently, land surfaces of the lowlands are generally level and less than 100 feet above sea level. Substantial areas are less than 30 feet above sea level and are characterized by extensive wetlands.

The project area has been sculptured from an alluvial plain underlain by sand, gravel, silt, and clay. Soil surveys for the project area identified the areas for placement of the scallops as "Waters of the Gulf of Mexico," and no soils data are provided (NRCS 2004). The natural bay shoreline is fringed by wide, shallow sand flats between 3 and 5 feet deep.

Environmental Consequences

Bay scallop enhancement would have no effect on geology or substrates in the proposed project areas because there would be no construction activities that would disturb geology or substrate. Bay scallops would be placed in areas where existing habitat conditions, including naturally occurring geologic features and substrate, are appropriate for bay scallops.

12.23.5.2.2 Hydrology and Water Quality

Affected Resources

Northwest Florida has seven major watersheds, all of which have been identified as priorities under the Surface Water Improvement and Management (SWIM) program. Water quality protection is the underlying goal of SWIM, along with the preservation and restoration of natural systems and associated public uses and benefits (Northwest Florida Water Management District [NWFWMD] 2011). The project areas are located in the following watersheds: Pensacola Bay watershed, Choctawhatchee River and Bay watershed, and St. Andrew Bay watershed.

Big Lagoon, Pensacola Bay, and western and central Santa Rosa Sound are part of the Pensacola Bay watershed system. The waterways in this system are primarily used for transportation, seafood harvesting, recreation, and waste disposal. The total drainage area covers nearly 7,000 square miles, approximately 34% of which is in Florida. The entire system discharges into the Gulf of Mexico, primarily through a narrow pass at the mouth of Pensacola Bay (NWFWMD 2013). Broad issues for the Pensacola Bay system include water and sediment quality degradation through point and nonpoint pollution sources; habitat quality, which is threatened by and degraded through sedimentation and deposition; management and coordination between two states and numerous local governments and agencies; and public education and awareness (Thorpe 1997).

Choctawhatchee Sound and eastern Santa Rosa Sound are part of the Choctawhatchee River and Bay watershed system. The total drainage area of the Choctawhatchee River and Bay watershed system covers nearly 5,350 square miles, approximately 42% of which is in Florida. East Pass, located immediately west of Destin, provides the only direct opening to the Gulf of Mexico. The bay also opens up to Santa Rosa Sound in the west and the Intracoastal Waterway in the east. The Choctawhatchee River and Bay system has long been known for its rich, diverse ecology; economic benefits; and numerous recreational opportunities. Over recent decades, however, many of the area's water resources have been impacted by population growth, development, and wastewater disposal. Increased coastal development,

in particular, has contributed to displaced habitats; loss of wetlands; and greater amounts of stormwater runoff entering the river, bay, and their tributaries. Stormwater carries contaminants such as dirt, heavy metals, bacteria, nutrients from fertilizer and other sources, and various chemicals.

St. Andrew Bay and St. Joseph Bay are part of the St. Andrew Bay watershed system. The total drainage area of this watershed covers nearly 749,663 acres. The waterways are primarily used for transportation, seafood harvesting, recreation, and waste disposal. Broad issues for the St. Andrew Bay system include degradation through point and nonpoint pollution sources, habitat quality that is threatened by and degraded through sedimentation and deposition, and public education and awareness (Thorpe 2000).

The aquatic preserves in the project area are classified as an Outstanding Florida Water (OFW) by the State of Florida (62-302.700, Fla. Admin. Code). An OFW is a water designated worthy of special protection because of its natural attributes (e.g., excellent water quality or exceptional ecological, social, educational, or recreational value). OFWs are protected through more stringent requirements for activities requiring a permit from the FDEP or a water management district. Waters are designated OFWs to prevent the lowering of existing water quality and to preserve the exceptional features of the waterbody.

Surface waters in the project area are classified as Class II and III waters by the FDEP (FDEP 2013). Class II waters have designated uses of shellfish propagation or harvesting. Class III waters have the designated uses of fish consumption; recreation; and propagation and maintenance of a healthy, well-balanced population of fish and wildlife.

Impaired waters are waters that are too polluted or otherwise degraded to meet the water quality standards set by states, territories, or authorized tribes. Big Lagoon and St. Joseph Bay have been listed as an impaired waterbodies for mercury in fish tissue; however, total maximum daily loads (TMDLs) have not yet been adopted. Pensacola Bay has been listed as an impaired waterbody for mercury in fish tissue, dissolved oxygen, and fecal coliform; however, TMDLs have not yet been adopted. Santa Rosa Sound, Choctawhatchee Bay, and St. Andrew Bay have been listed as an impaired waterbodies for mercury in fish tissue and fecal coliform; however, TMDLs have not yet been adopted (Environmental Protection Agency [EPA] 2010).

Wetlands

The proposed project would take place in open water. Based on the National Wetland Inventory data, there are no wetlands identified in the project areas (USFWS 2013b).

Floodplains

The proposed project would take place in open-water, and therefore would not be located in a floodplain.

Environmental Consequences

Although unlikely, water quality would be potentially impacted during placement of the scallops from equipment leaks or spills or disturbance of sediments that result in siltation, turbidity, and the release of chemicals from sediments. If the disturbed sediments are anoxic, the biological oxygen demand in the water column could temporarily increase. With required mitigation in place, the effect on hydrology and

water quality would be measurable or detectable but small, short term, and localized. Water quality impacts would quickly become undetectable, and the area's hydrology would be only temporarily altered during construction.

This project would not impact groundwater, wetlands, or floodplains. Should wetlands be impacted, a wetlands permit that stipulates appropriate BMPs and mitigation requirements would be necessary. The proposed project is not anticipated to require authorization by the U.S. Army Corps of Engineers (Corps) pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA).

12.23.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

The Clean Air Act (CAA) requires that the Environmental Protection Agency (EPA) set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. NAAQS have been set for six common air pollutants (also known as criteria pollutants)—particle pollution or particulate matter, ozone, carbon monoxide, sulfur dioxide (SO_2), nitrogen dioxide, and lead. Particulate matter is defined as fine particulates with a diameter of 10 micrometers or less (PM_{10}) and fine particulates with a diameter of 2.5 micrometers or less ($PM_{2.5}$). When a designated air quality area or airshed in a state exceeds the NAAQS, that area may be designated as a "nonattainment" area. Areas with levels of pollutants below the health-based standard are designated as "attainment" areas. To determine whether an area meets the NAAQS, air monitoring networks have been established and are used to measure ambient air quality. The EPA also regulates 187 hazardous air pollutants (HAPs) that are known or suspected to cause cancer or have other serious health impacts. Air quality in the Florida panhandle is in attainment with the NAAQs (EPA 2013a).

Greenhouse Gases

Gases that trap heat in the air are called greenhouse gases (GHGs). The primary GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_x), and fluorinated gases. Over the past century, human activities have released large amounts of GHGs into the atmosphere, which are contributing to global warming. Global warming is defined as the ongoing rise in global average temperatures near the Earth's surface and is known to cause changes in climate patterns.

According to the EPA, the average annual temperature in the southeast portion of the United States has increased by approximately 2.0°F (degrees Fahrenheit) since 1970. Winters, in particular, are getting warmer, and the average number of freezing days has decreased by 4 to 7 days per year since the mid-1970s. Most areas are getting wetter; autumn precipitation has increased by 30% since 1901 (EPA 2013b). In many parts of the region, the number of heavy downpours has increased. Despite the increases in fall precipitation, the area affected by moderate and severe drought has increased since the mid-1970s (EPA 2013b).

Average annual temperatures in the region are projected to increase from 4°F to 9°F by 2080. Hurricane-related rainfall is projected to continue to increase. Models suggest that rainfall would arrive in heavier downpours, with increased dry periods between storms. These changes would increase the risk of both flooding and drought. The coasts would likely experience stronger hurricanes and sea level rise. Storm surge could present problems for coastal communities and ecosystems (EPA 2013b).

Total GHG emissions in Florida from 1990 to 2007 have increased at an average rate of 2.1% per year. Total GHG emissions in 2007 were 290 million metric tons of CO_2 equivalent ($MMTCO_2E$). In 2007, 91% of GHG emissions in Florida were CO_2 emissions (FDEP 2010).

Environmental Consequences

Project implementation would require the use of outboard motors and tow vehicles, which would lead to temporary air pollution (e.g., criteria pollutants, HAPs, GHGs) due to emissions. Any air quality impacts that occur would be minor due to their localized nature, short-term duration, and the small size of the project. Available BMPs would be employed to prevent, mitigate, and control potential air pollutants during project implementation. No air quality–related permits would be required. The project area is currently in attainment with NAAQS. The proposed action would not affect the attainment status of the project area or region. A State Implementation Plan conformity determination (42 United States Code [USC] 7506 (c)) is not required because the project area is in attainment for all criteria pollutants.

Project plans have not been finalized for this project. While outboard motors and tow vehicles would be used, it is unclear what the duration of use for each type of equipment would be. The following table provides GHG emissions estimates for a variety of construction and transportation equipment types that may be used for the scallop enhancement project. Each of these emissions estimates is based on use of the heavy equipment for an 8-hour day (Table 12-54).

Table 12-54. Greenhouse gas emissions for various types of mechanized equipment.

EQUIPMENT DESCRIPTION[1]	TOTAL HOURS USED	CO_2 FACTOR-mt/100 hrs*	CO_2 (mt)[2]	CH_4 FACTOR-mt/100 hrs	CH_4 (mt)	N_2O FACTOR-mt/100 hrs	N_2O (mt)	TOTAL CO_2 (mt)
Boat (single outboard motor)	3,000	0.65	19.5	0.02	0.6	0.26	7.8	27.9
Pickup truck[4]	320	1.1	3.52	0.35	1.12	4.4	14.08	18.72
Total	**3,320**							**46.62**

*mt = metric tons

[1] Emissions assumptions for all equipment are based on 8 hours of operation.

[2] CO_2 emissions assumptions for diesel and gasoline engines are based on EPA 2009.

[3] CH_4 and NO_X emissions assumptions and CO_2e calculations are based on EPA 2011.

[4] Emissions assumptions for an 8-cylinder, 6.2-liter gasoline engine Ford F150 pickup are based on Department of Energy 2013 and 18 gallon (half-tank) daily fuel consumption.

Based on the assumptions described in Table 12-54 above, GHG emissions would not exceed 25,000 metric tons per year. Given the projected construction-phase GHG emissions, predicted impacts on air quality from GHG emissions would be anticipated to be minor in both the short term and the long term.

12.23.5.2.4 Noise

Affected Resources

Noise can be defined as unwanted sound and noise levels, and its impacts are interpreted in relation to impacts on nearby visitors to the recreational areas and wildlife in the project vicinity. The Noise Control Act of 1972 (42 USC 4901–4918) was enacted to establish noise control standards and to regulate noise emissions from commercial products such as transportation and construction equipment. The standard measurement unit of noise is the decibel (dB), which represents the acoustical energy present. Noise levels are measured in A-weighted decibels (dBA), a logarithmic scale that approaches the sensitivity of the human ear across the frequency spectrum. A 3-dB increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear. Table 12-55 shows typical noise levels for common sources expressed in dBA. Noise exposure depends on how much time an individual spends in different locations.

Table 12-55. Common noise levels.

NOISE SOURCE OR EFFECT	SOUND LEVEL (dBA)
Rock-and-roll band	110
Truck at 50 feet	80
Gas lawnmower at 100 feet	70
Normal conversation indoors	60
Moderate rainfall on foliage	50
Refrigerator	40
Bedroom at night	25

Source: Adapted from U.S. Department of Energy and Bonneville Power Administration (1986).

Noise levels in the project area vary depending on the season, time of day, number and types of noise sources, and distance from noise sources. Existing noise in the project area is mainly from recreational boating, with occasional overhead aircraft or commercial traffic. Ambient natural sounds such as wind, waves, and wildlife also contribute to existing noise levels. Existing ambient noise levels in the project area would be generally low and predominantly result from daily boating activities.

Noise-sensitive receptors include sensitive land uses as well as individuals and/or wildlife that could be affected by changes in noise sources or levels due to the proposed project. Noise-sensitive receptors in the project vicinity include beach and park recreational use and wildlife. The shoreline of the project area supports a variety of residential and industrial developed areas, and the Gulf of Mexico supports commercial and recreational boat traffic.

Environmental Consequences

Instances of increased noise would occur during the project. Equipment and vehicles used during the implementation of the project would generate noise. Equipment noise is known to disturb fish, marine mammals, and nesting shorebirds. The noise would be temporary, and would only occur during the

placement of the scallops. Because of the temporary nature of the noise, negative impacts to the soundscape would be short term and of a level not likely to affect current user activities.

After completion of the project, the soundscape would return to pre-project levels. The potential for increased boat traffic exists in the scallop enhancement areas, which would result in a slight increase in noise levels in the vicinity. Overall, long-term noise impacts from boating and other recreational activities would remain minor.

12.23.5.3 Biological Environment

12.23.5.3.1 Living Coastal and Marine Resources

Vegetation

Affected Resources
Portions of the project areas are designated by the State of Florida as aquatic preserves for their known natural resource occurrences and regional ecological significance. Seagrass communities characterize the submerged aquatic vegetation of the three projects in aquatic preserves. In addition, the adjacent shorelines in potential project locations include a mix of saltmarsh and sandy beach habitat.

The seagrass communities of St. Joseph Bay, St. Andrew Bay, and Alligator Harbor are dominated by turtlegrass (*Thalassia testudinum*). Shoal grass (*Halodule wrightii*) and manatee grass (*Syringodium filiforme*) are interspersed in the seagrass communities, depending on the project area.

Seagrass communities are essential breeding, rearing, and feeding grounds for many important recreational and commercial fisheries as well as wildlife including the endangered West Indian manatee (*Trichechus manatus)* and various species of sea turtles.

Environmental Consequences
Project installation activities would use BMPs, including impact avoidance of existing seagrass habitat through the use of small vessels for placement of scallops. Every effort would be made to access the scallop placement sites during periods of high tide using shallow draft vessels to minimize potential adverse impacts to seagrass habitat as a result of navigation. Therefore, impacts to seagrass would be short term and minor. The project would result in minor short-term impacts to vegetation. Impacts may be detectable, but would not alter natural conditions and would be limited to localized areas.

Wildlife Habitat

Affected Resources
The aquatic preserves in the project area provide crucial nursery and forage habitat for many commercial and recreational fisheries and wildlife such as marine and estuarine invertebrates, seabirds, wading birds (herons and egrets), swimmers (cormorants and anhingas), and birds of prey that feed on juvenile and adult fish (FDEP 2008). Common seabirds include terns, gulls, skimmers, double-crested cormorant, American white pelican (*Pelecanus erythrorhynchos*), and brown pelican (*Pelecanus occidentalis*). The most common resident marsh and wading birds are great blue heron (*Ardea herodias*), little blue heron (*Egretta caerulea*), white ibis (*Eudocimus albus*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), tricolored egret (*Egretta tricolor)*, yellow-crowned night heron (*Nyctanassa violacea*),

and black-crowned night heron (*Nycticorax nycticorax*). Urban and open vacant land adjacent to the project area may serve as a refuge and staging area for many passerine birds during migration, and large concentrations of shorebirds are sometimes observed feeding in the mudflats. Protected wildlife (such as sea turtles, porpoises, and manatee, discussed in detail below) also forage on or within seagrass communities at the project sites.

Environmental Consequences

The proposed project would take place in open water. Open-water scallop enhancement activities would include in-water work that could disturb foraging, feeding or resting birds or other wildlife due to project activities. This would be a short-term, minor impact, and wildlife or birds would be expected to move away during the disturbance. Additionally, foraging habitat is abundant in the project areas, and the scallop enhancement activities would take place in only a small portion of these areas. Therefore, foraging birds or other wildlife would not be impacted as a result of scallop enhancement activities.

Marine and Estuarine Fauna (fish, shell beds, and benthic organisms)

Affected Resources

The project area provides habitat for numerous fish and other marine species. The value of marine habitats at the project site has been affected by population growth, development, and wastewater disposal. Increased coastal development, in particular, has contributed to displaced habitats, loss of wetlands, and greater amounts of stormwater runoff entering the river, bay, and their tributaries (NWFWMD 2011). Nonetheless, the marine environment at the project site provides habitat to an array of aquatic species, including ladyfish (*Elops saurus*), hardhead catfish (*Arius felis*), gafftopsail catfish (*Bagre marinus*), and pigfish (*Orthopristis chrysoptera*), among others. Benthic organisms such as bivalves, gastropods, and other mollusks; anemones; amphipods; annelids; crustaceans; and echinoderms are also abundant in these waters (FWC 2001).

Environmental Consequences

The proposed project would likely result in short-term, minor impacts to fish that may be present during the in-water construction as a result of turbidity and noise disturbance during placement of the scallops. Benthic organisms that may be present in the substrate may also be impacted during scallop placement. However, these impacts would be short term and minor and would not result in a measurable impact to these species. The proposed project would result in long-term benefits to marine and estuarine fauna by providing additional fish habitat, increased benthic productivity, and enhanced recruitment and production of fish and crustaceans. Over the life of the project, the quality of the aquatic habitat would increase.

Protected Species

Affected Resources

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

The Trusteeshave reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS. For this, the Trusteesfirst reviewed the species list for Escambia, Santa Rosa, Okaloosa, Bay, Gulf, and Franklin counties, Florida where the project could be implemented[31]. Table 12-56 presents a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

Table 12-56. Potential Impacts to Species/Critical Habitats managed by USFWS

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle[a], Hawksbill turtle[a], Kemp's ridley turtle; Leatherback turtle[a], Loggerhead turtle	No work will occur in the terrestrial environment; therefore no impacts will occur to sea turtle species in the terrestrial environment. Consultation has been completed with NMFS, the agency that has jurisdiction to review impacts to sea turtles in the estuarine and marine environments. The main risk to sea turtles during execution of this project would come from boat collisions which could result in harm or mortality. Critical habitat for the green sea turtle has been designated for the waters surrounding Culebra Island, Puerto Rico, and its outlying keys (63 FR 46693). Marine and terrestrial critical habitat for the leatherback sea turtle has been designated at Sandy Point on the western end of the island of St. Croix, U.S. Virgin Islands (44 FR 17710) and critical habitat will be reassessed during the future planned status review (76 FR 47133). Critical habitat for the hawksbill sea turtle has been designated for selected beaches and/or waters of Mona, Monito, Culebrita, and Culebra Islands, Puerto Rico (63 FR 46693). No designated critical habitat for the green, leatherback, or hawksbill sea turtles occurs within the action area. No critical habitat has been designated for the Kemp's ridley sea turtle; therefore, none will be adversely affected or modified. The project area does not overlap with the currently proposed critical habitat areas in Florida for Northwest Atlantic Distinct Population Segment of the loggerhead sea turtle as these habitats are terrestrial (i.e., beaches and shorelines) (78 FR 18000)Department of the Interior, 2013). In addition, the project will not result in any changes to the shoreline habitat; therefore any adjacent critical habitat will not be affected.
West Indian manatee	The counties in the project area are not part of the 36 Florida counties that are identified as being counties where manatees regularly occur in coastal and inland waters (U.S. Department of the Interior, 2011). However, manatees could be present in the project waters and would potentially seek out shallow seagrass areas as they are preferred feeding habitat (U.S. Department of the Interior, 2011). The main risk to manatees during execution of this project would come from boat collisions which could result in harm or mortality. Based upon the implementation of the conservation measures the Trusteesanticipate effect to manatees from the proposed project will be insignificant and discountable.

[31] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Piping plover	The main risk to Piping plovers is from human disturbance while resting, foraging in habitats adjacent to marine work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the plovers to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The proposed project will not result in any changes to shoreline habitats where piping plover could be feeding or resting and is not expected to increase visitor use though existing visitors may scallop; therefore, no indirect impacts are expected. The project will not result in any changes to the shoreline habitat; therefore any adjacent critical habitat will not be affected.
Red knot	The main risk to Red knots is from human disturbance while resting, foraging in habitats adjacent to marine work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the red knots to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The proposed project will not result in any changes to shoreline habitats where red knot could be feeding or resting and is not expected to increase visitor use though existing visitors may scallop; therefore, no indirect impacts are expected.
Gulf sturgeon	NMFS was consulted on Gulf sturgeon and its Critical Habitat in the estuarine environment. As a result, Gulf Sturgeon was not considered in the consultation with the USFWS.

In addition to the protected species managed by USFWS, the Trusteesreviewed the proposed projects and associated actions for potential impacts to the following protected species (status indicated) and their associated critical habitat, if appropriate, managed by NMFS:

- Gulf Sturgeon, *Acipenser oxyrinchus desotoi*, Threatened
- Smalltooth Sawfish, *Pristis pectinata,* Endangered
- Green Sea Turtle, *Chelonia mydas*, Endangered
- Loggerhead Sea Turtle, *Caretta caretta*, Threatened
- Hawksbill Sea Turtle, *Eretmochelys imbricata*, Endangered
- Leatherback Sea Turtle, *Dermochelys coriacea*, Endangered
- Kemp's Ridley Sea Turtle, *Lepidochelys kempii*, Endangered

Additional information on some of these species is provided below.

Sea Turtles and Marine Mammals

There are five species of endangered or threatened sea turtles that may occur or have potential to occur in the project area. These include green turtle (*Chelonia mydas)*, hawksbill turtle (*Eretmochelys imbricata)*, Kemp's ridley turtle (*Lepidochelys kempii)*, leatherback turtle (*Dermochelys coriacea)*, and loggerhead turtle (*Caretta caretta)*. Sea turtles forage in the waters of the coastal Florida panhandle region and have potential to occur in the waters where in-water work is proposed. The project site would be located in open water and therefore does not contain sea turtle nesting habitat.

Manatees could be present in project area waters and would potentially seek out shallow seagrass areas because those are preferred feeding habitat (U.S. Department of the Interior 2011). Additionally, bottlenose dolphin (*Tursiops*) populations are known to migrate into bays, estuaries, and river mouths,

and could be located in the proposed project area (NMFS 2013a). Bottlenose dolphins have been observed entering and leaving Choctawhatchee Bay and in nearshore coastal waters (NMFS 2012).

Smalltooth Sawfish, Gulf Sturgeon, and Gulf Sturgeon Critical Habitat

Smalltooth sawfish (*Pristis pectinata*) do not typically use northern Gulf of Mexico waters (NMFS 2013b). Gulf sturgeon are restricted to the Gulf of Mexico and its drainages, occurring primarily from the Pearl River in Louisiana to the Suwannee River, in Florida (NMFS 2009). Adult fish reside in rivers for 8 to 9 months each year and in estuarine or Gulf of Mexico waters during the 3 to 4 cooler months of each year (NMFS 2009). Important marine habitats include seagrass beds with sand and mud substrates (Mason and Clugston 1993).

Gulf sturgeon critical habitat was jointly designated by the NMFS and USFWS on April 18, 2003 (50 Code of Federal Regulations [C.F.R.] 226.214). The proposed project site is located within winter feeding and migration critical habitat for Gulf sturgeon. See Figure 12-48 for a map of critical habitat in the project area. Critical habitat was designated based on seven primary constituent elements (PCEs) essential for the species' conservation, as defined in the 2003 *Federal Register*. The seven elements of PCEs are listed below. Critical habitat within the project area contains PCE's 1, 5, 6, and 7.

1. Abundant food items such as detritus, aquatic insects, worms, and/or mollusks, within riverine habitats for larval and juvenile life stages, and abundant prey items such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks, and/or crustaceans within estuarine and marine habitats and substrates for subadult and adult life stages.
2. Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay.
3. Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, and generally but not always located in holes below normal riverbed depths; these are believed necessary for minimizing energy expenditure during freshwater residency and possibly for osmoregulatory functions.
4. A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging.
5. Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages.
6. Sediment quality, including texture and chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.
7. Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., an unobstructed river or a dammed river that still allows for passage).

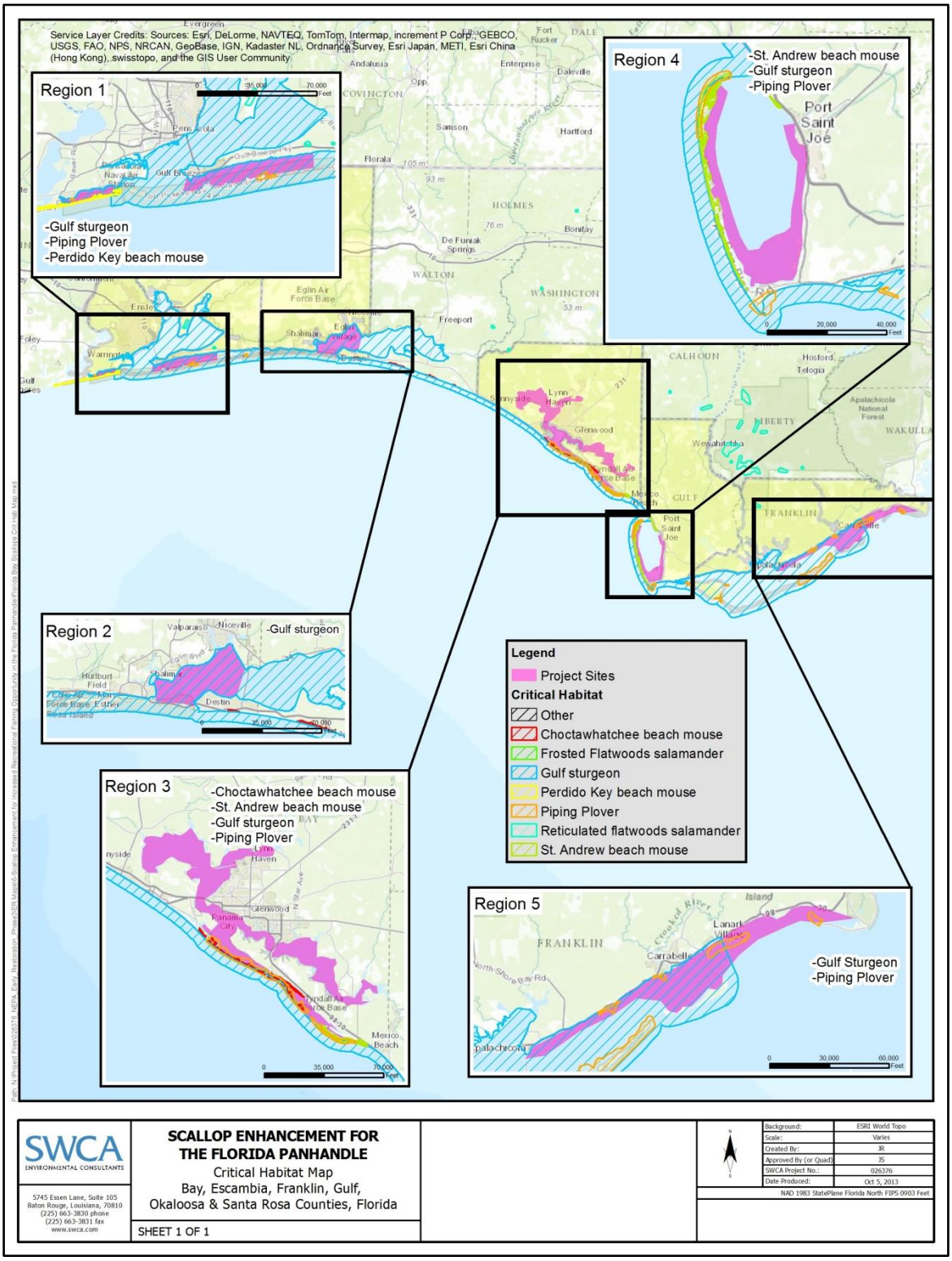

Figure 12-48. Critical habitat map.

Piping Plover

The sandy beaches and shorelines adjacent to the project area offer suitable foraging and resting habitat for the piping plover during the winter migratory season, and piping plover may forage in the shallow waters of the project area. Natural shorelines in the proposed project vicinity provide suitable winter migration resting habitat for the piping plover. Piping plover wintering habitat includes beaches, mudflats, and sandflats, as well as barrier island beaches and spoil islands (Haig 1992, as cited by USFWS 2013d). On the Gulf Coast, preferred foraging areas are associated with wider beaches, mudflats, and small inlets (USFWS 2013d).

Red Knot

The red knot, a federal proposed species, uses Florida both for wintering habitat and as a stopover habitat for those migrating down to specific wintering locations in South America (Niles et al. 2008). Wintering and migrating red knots forage along sandy beaches, tidal mudflats, salt marshes, and peat banks (Harrington 2001). Observations indicate that red knots also forage on oyster reef and exposed bay bottoms, and roost on high sandflats, reefs, and other sites protected from high tides (Niles et al. 2008). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Threats to wintering and stopover habitat in Florida include shoreline development, hardening, dredging, deposition, and beach raking (Niles et al. 2008).

Essential Fish Habitat

EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse impacts on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. The EFH within the project area include emergent wetlands, mud substrate, and estuarine water columns for species of fish, such as red drum, brown shrimp, pink shrimp, and white shrimp. There are no marine components of EFH in the vicinity of the project site.

Table 12-57 provides a list of the species that NMFS manages under the federally implemented fishery management plans in the vicinity of the in St. Joseph Bay Aquatic Preserve in Gulf County, and additional potential sites in Alligator Harbor Aquatic Preserve in Franklin County, and St. Andrews Aquatic Preserve, in Bay County.

Table 12-57. Federally managed fisheries with designated Essential Fish Habitat (EFH) in the proposed project area.

EFH CATEGORY	SPECIES
Atlantic Highly Migratory Species	
	Atlantic Sharpnose Shark - Adult
	Atlantic Sharpnose Shark - Juvenile
	Atlantic Sharpnose Shark - Neonate
	Blacknose Shark - Adult
	Blacknose Shark - Juvenile

EFH CATEGORY	SPECIES
	Blacknose Shark - Neonate
	Blacktip Shark - Adult
	Blacktip Shark - Juvenile
	Blacktip Shark - Neonate
	Bonnethead Shark - Adult
	Bonnethead Shark - Juvenile
	Bonnethead Shark - Neonate
	Bull Shark - Adult
	Bull Shark - Juvenile
	Finetooth Shark - Adult and Juvenile
	Finetooth Shark - Neonate
	Great Hammerhead Shark - All
	Lemon Shark - Adult
	Lemon Shark - Juvenile
	Lemon Shark - Neonate
	Nurse Shark - Adult
	Nurse Shark - Juvenile
	Sailfish - Juvenile
	Sandbar - Shark Adult
	Sandbar - Shark Neonate
	Scalloped Hammerhead Shark - Adult
	Scalloped Hammerhead Shark - Juvenile
	Scalloped Hammerhead Shark - Neonate
	Silky Shark - All
	Spinner Shark - Adult
	Spinner Shark - Juvenile
	Spinner Shark - Neonate
	Tiger Shark - Juvenile
	Tiger Shark - Neonate
Coastal Migratory Pelagics of the Gulf of Mexico AND South Atlantic	
	Cobia
	King Mackerel
	Spanish Mackerel
Gulf of Mexico Red Drum	
	Red Drum
Gulf of Mexico Shrimp	
	Brown Shrimp
	Pink Shrimp
	Royal Red Shrimp
	White Shrimp
Reef Fish Resources of the Gulf of Mexico	
	Almaco Jack

EFH CATEGORY	SPECIES
	Banded Rudderfish
	Black Grouper
	Blackfin Snapper
	Blueline Tilefish
	Cubera Snapper
	Gag
	Goldface Tilefish
	Gray (Mangrove) Snapper
	Gray Triggerfish
	Greater Amberjack
	Hogfish
	Lane Snapper
	Lesser Amberjack
	Mutton Snapper
	Nassau Grouper
	Queen Snapper
	Red Grouper
	Red Snapper
	Scamp
	Silk Snapper
	Snowy Grouper
	Speckled Hind
	Tilefish
	Vermilion Snapper
	Warsaw Grouper
	Wenchman
	Yellowedge Grouper
	Yellowfin Grouper
	Yellowmouth Grouper

State-Listed Birds, MBTA and BGEPA

Migratory bird species are protected under the MBTA. There are also numerous State of Florida–listed bird species with potential to occur in and around the scallop enhancement sites. These include, but are not limited to, the Arctic peregrine falcon (*Falco peregrinus tundrius*), least tern (*Sterna antillarum*), southeastern American kestrel (*Falco sparverius paulus*), Florida sandhill crane (*Grus canadensis pratensis*), American oystercatcher (*Haematopus palliates*), and southeastern/Cuban snowy plover (*Charadrius alexandrinus tenuirostris*). The nesting season in Florida is from February 15 to August 13.

The bald eagle was delisted by the USFWS and is not listed as threatened or endangered by the FWC. The bald eagle is, however, protected by state law pursuant to 68A-16, Fla. Admin. Code and by the U.S. government under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles feed on fish and other readily available mammalian and avian species and are dependent on

large, open expanses of water for foraging habitat. According to the FWC Bald Eagle Nest Locator, bald eagles are known to nest on the shorelines surrounding some of the project sites (FWC 2012). In Florida, conservation measures to protect active nest sites during nesting season must be considered to reduce potential disturbances of certain project activities.

The proposed project was also reviewed for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), respectively. Table 12-58 provides a summary of the different migratory bird groups specifically addressed by this review and summarizes the potential impacts to these groups and associated habitats that could result from the implementation of this project.

Table 12-58. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, roosting, nesting	Seabirds forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily roost in the dunes. Therefore the Trusteesdo not anticipate impacts from the proposed project since activities are all in-water.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in Table 12-59.

Table 12-59. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care will be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbances will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project will occur during daylight hours only. Nesting will not be impacted activity is limited to open water areas.

Environmental Consequences

The proposed project has been evaluated for potential short- and long-term impacts to state and federally listed threatened and endangered species that may occur in and adjacent to the project area based on available suitable habitat and restoration goals. Descriptions of these evaluations are provided below.

Protected Species

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On January 23, 2014 the review of potential impacts to species managed by USFWS was completed (McClain, 2014). The USFWS concurred with the Trustees'determination that the proposed project may

affect, but is not likely to adversely affect West Indian manatee, piping plover, and red knot (if listed). The USFWS also concurred with the Trustees'determination that the project will not adversely modify or destroy critical terrestrial habitat for the loggerhead sea turtle if designated and that the project would have no effect on five species of sea turtles in terrestrial habitats (green, hawksbill, Kemp's ridley, leatherback, and loggerhead).

The Trustees'review of the potential impacts of the project for protected species managed by NMFS determined the proposed action "may affect, but is not likely to adversely affect" the following species and associated critical habitats in the project implementation area:

- Gulf Sturgeon - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Gulf Sturgeon Critical Habitat – The project footprint does fall within identified Gulf sturgeon critical habitat units (9, 10, 12, and 13); however, it has been determined that project implementation will not adversely modify designated Gulf sturgeon critical habitat.
- Smalltooth Sawfish – The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Green Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Loggerhead Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Hawksbill Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Leatherback Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.
- Kemp's Ridley Sea Turtle - The proposed project may affect, but is not likely to adversely affect and will not jeopardize the continued existence of the species.

On April 14, 2014 NMFS completed its review and concurred with these conclusions (Crabtree, 2014).

The Trustees also evaluated the potential for take of Marine Mammals under the MMPA and due to these species' mobility and the implementation of NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006), *Standard Manatee Conditions for In-Water Work* (USFWS 2011), and USFWS recommended conservation measures for listed species and other trust resources, take of marine mammals under the MMPA is not anticipated.

Essential Fish Habitat

The Trustees'review of potential impacts to EFH in the proposed locations for the Seagrass restoration project concluded the project would not result in the creation or conversion of one EFH habitat type to another type, as Seagrass planting is proposed to occur in areas that supported Seagrass prior to propeller scarring. Disturbance to any EFH and species using the Seagrass habitat in areas adjacent to locations where scars would be restored would be minor and short in duration, with risks further mitigated by following identified best management practices during construction. No adverse impacts to other EFH types will result from the proposed restoration techniques. As a result, the Trusteesconcluded the project is not likely to adversely affect EFH.

On March 17, 2014 NMFS completed its evaluation of potential EFH impacts and concluded adverse impacts to EFH as a result of the proposed project would be brief and insignificant (Fay, 2014).

State-Listed Birds, MBTA, BGEPA

State-listed birds such as oystercatchers (*Haematopus* sp.*)* or least terns may nest on beaches or mudflats in the vicinity of the project area.. If project activities occur during the nesting season (February 15 to August 13), these birds could be disturbed by noise generated by in-water activities. In such circumstances, FWC nesting shorebird avoidance measures will be followed. These measures generally call for surveys within 300 feet and an avoidance buffer of 300 feet for nesting birds.

In recent years, the bald eagle has been removed from the endangered species list under the ESA, though they are protected by the BGEPA. In Florida, the FWC protects the bald eagle pursuant to 68A-16, Fla. Admin. Code, and conservation measures to protect active nest sites during the nesting season must be considered to reduce potential disturbances from certain project activities.

Multiple bald eagles nests are known to occur near the shorelines of the project area (FWC 2012). Based on the distance from proposed project activities (greater than 660 feet), nesting of the known occurrence of bald eagle would not be impacted. Consultation with the FWC concerning the proposed project and anticipated implementation schedule relative to known bald eagle nest sites in the project vicinity and the nesting season in Florida (October 1 to May 15) would be required prior to commencement of restoration activities. To minimize potential for impacts to nesting bald eagles, the consultation protection measures may include 1) addressing prescribed nest tree protection zones, and 2) preparation of a bald eagle nest protection plan (including nesting behavior disturbance monitoring). Bald eagles have been known to tolerate certain potential disturbances in their breeding territories. Should these conservation measures be implemented for active nest sites adjacent to enhancement activities in the project area, potential impacts to the bald eagle would be short term and minor.

At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

Invasive Species

Affected Resources

Non-native invasive species could alter the existing terrestrial or aquatic ecosystem within, and possible expand out into adjacent areas after the initial introduction. The invasive species threat, once realized, could result in economic damages. Prevention is ecologically responsible and economically sound. Chapter 3 described more about the regulations addressing invasive species, pathways, impacts, and prevention. At this time specific invasive species that may be present on the project site or could be introduced through the project have not yet been identified.

Environmental Consequences

Best Management Practices (BMPs) to control the spread of any invasive species present, and prevent the introduction of new invasive species due to the project will be implemented. In general, best management practices would primarily address risk associated with vectors (e.g., construction equipment, personal protective equipment, delivery services, foot traffic, vehicles/ vessels, shipping material). There are many resources that provide procedures for disinfection, pest-free storage, monitoring methods, evaluation techniques, and general guidelines for integrated pest management that can be prescribed based upon specific site conditions and vectors anticipated. In addition, to best management practices, outreach and educational materials may be provided to project workers and potential users/visitors. Other measures that could be implemented are identified in the Chapter 6 Appendix. Due to the implementation of BMPs, the Trusteesexpect impacts due to invasive species introduction and spread to be short term and minor.

12.23.5.4 Human Uses and Socioeconomics

12.23.5.4.1 Socioeconomics and Environmental Justice

Affected Resources

The following table (Table 12-60) contains population/minority data for Bay, Escambia, Santa Rosa, Okaloosa, Walton, Gulf, and Franklin Counties and Florida (U.S. Bureau of the Census 2010).

Table 12-60. Populations of Florida and Project Area Counties.

TOPIC	FLORIDA	BAY COUNTY	ESCAMBIA COUNTY	SANTA ROSA COUNTY	OKALOOSA COUNTY	WALTON COUNTY	GULF COUNTY	FRANKLIN COUNTY
2010 total population	18,801,310	168,852	297,619	151,372	180,822	55,043	15,863	11,549
White alone	14,109,162 (75.0%)	138,731 (82.2%)	204,993 (68.9%)	132,920 (87.8%)	146,582 (81.1%)	48,351 (87.8%)	12,578 (78.1%)	9,540 (82.6%)
Black or African American alone	2,999,862 (16.0%)	18,180 (10.8%)	68,282 (22.9%)	8,205 (5.4%)	16,797 (9.3%)	3,178 (5.8%)	2,962 (18.7%)	1,589 (13.8%)
American Indian and Alaska Native alone	71,458 (0.4%)	1,153 (0.7%)	2,623 (0.9%)	1,306 (0.9%)	1,068 (0.6%)	488 (0.9%)	63 (0.4%)	58 (0.5%)
Asian alone	454,821 (2.4%)	3,353 (2.0%)	8,174 (2.7%)	2,759 (1.8%)	5,328 (2.9%)	499 (0.9%)	46 (0.3%)	26 (0.2%)

TOPIC	FLORIDA	BAY COUNTY	ESCAMBIA COUNTY	SANTA ROSA COUNTY	OKALOOSA COUNTY	WALTON COUNTY	GULF COUNTY	FRANKLIN COUNTY
Native Hawaiian and other Pacific Islander alone	12,286 (0.1%)	161 (0.1%)	430 (0.1%)	217 (0.1%)	354 (0.2%)	58 (0.1%)	4 (0.0%)	7 (0.1%)
Some other race alone	681,144 (3.6%)	2,039 (1.2%)	3,740 (1.3%)	1,463 (1.0%)	3,592 (2.0%)	1,169 (2.1%)	119 (0.8%)	133 (1.2%)
Two or more races	472,577 (2.5%)	5,235 (3.1%)	9,377 (3.2%)	4,502 (3.0%)	7,101 (3.9%)	1,300 (2.4%)	285 (1.8%)	196 (1.7%)
Median household income, 2007–2011	$47,827	$48,225	$43,707	$55,913	$54,140	$46,926	$41,291	$37,017
Persons below poverty level, percent, 2007–2011	14.7%	12.4%	16.9%	10.8%	11.7%	14.9%	17.5%	24.0%

Environmental Consequences

The proposed action would not result in short-term impacts during placement of the scallops. Long-term, indirect, moderate benefits would result from increasing fisheries habitat and recreational and fishing value of the area due to the increased availability of scallop populations.

This project is not designed to create a benefit for any group or individual, but rather would provide benefits on a local and regional basis. Because the project occurs in an area that is not disproportionately minority or low income (see Table 12-60), there are no indications that the proposed project would be contrary to the goals of Executive Order 12898, or would create disproportionate, adverse human health or environmental impacts on minority or low-income populations of the surrounding community.

12.23.5.4.2 Cultural Resources

Affected Resources

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project hasidentified the presence of two historic properties (the Perdido Key Historic District andNaval Live Oaks Reservation) within the project area.

Environmental Consequences

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

12.23.5.4.3 Land and Marine Management

Affected Resources

Bay scallop population enhancement would take place in open-water habitat in bays and nearshore Gulf of Mexico in Florida.

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS. The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process.

Environmental Consequences

The project would not require a variance, zoning change, or amendment to a land-use area or comprehensive management plan. The project's long-term impact would be minor because it would not affect overall use and management beyond the local project area. It would be consistent with current land use.

12.23.5.4.4 Tourism and Recreational Use

Tourism and recreation are common activities throughout the Florida panhandle region. Bay scallop enhancement would be completed at open-water locations throughout the panhandle, and may take place in some areas where tourism and recreation are common.

Environmental Consequences

Bay scallop population enhancement activities would have either no impact or a minor, long-term beneficial impact on tourism and recreational use. If successful, the project may provide increased opportunities for bay scallop harvesting, a popular recreational activity in Florida.

12.23.5.4.5 Aesthetics and Visual Resources

Affected Resources

Aesthetic and visual resources in bay scallop population enhancement areas are characterized by open-water nearshore habitat.

Environmental Consequences

Bay scallop population enhancement activities would have no impact on surface aesthetics, and visual resources and would not affect the viewscape or aesthetics of the surface environment because project areas are all underwater.

Bay scallop population enhancement may have a minor, long-term beneficial impact on underwater aesthetics and visual resources, particularly for snorkelers or scuba divers in or near restored areas.

12.23.5.4.6 Infrastructure

Affected Resources

Bay scallop enhancement actions would take place in open-water habitats, away from infrastructure, and would not include any activities that could affect infrastructure if it were present.

Environmental Consequences

Bay scallop population enhancement would not affect infrastructure because project work would take place in open-water habitat, away from existing infrastructure.

12.23.5.4.7 Public Health and Safety and Shoreline Protection

Affected Resources

The management of hazardous materials is regulated under various federal and state environmental and transportation laws and regulations, including the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Emergency Planning and Community Right-to-Know Act; and the Hazardous Materials Transportation Act. The purpose of the regulatory requirements set forth under these laws is to ensure the protection of human health and the environment through proper management (identification, use, storage, treatment, transport, and disposal) of hazardous materials. Some of these laws provide for the investigation and cleanup of sites that have already been contaminated by releases of hazardous materials, wastes, or substances.

The project would be conducted at multiple open-water locations throughout the Florida panhandle. Project locations would not be situated in areas with hazardous waste generation or disposal. A review of the Environmental Protection Agency's EnviroMapper revealed several sites located on the shorelines of the project areas (EPA 2013c).

Environmental Consequences

The project would require mechanical equipment that uses oil, lubricants, and fuels. The contractor would be required to take appropriate actions to prevent, minimize, and control the spill of construction-related hazardous materials such as vehicle fuels, oil, hydraulic fluid, and other vehicle maintenance fluids, and to avoid releases and spills.

12.23.6 Summary and Next Steps

The proposed Scallop Enhancement for Increased Recreational Fishing Opportunity in the Florida Panhandle project would involve enhancing local scallop populations in targeted areas in the Florida Panhandle. The proposed improvements include the harvesting and redistribution of naturally-occurring juvenile scallops supplemented with stocking from a commercial scallop hatchery. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would enhance and/or increase recreational fishing opportunities by increasing scallop

populations. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

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12.24 Shell Point Beach Nourishment: Project Description

12.24.1 Project Summary

The proposed Shell Point Beach Nourishment project would involve the renourishment of Shell Point Beach in Wakulla County. The proposed improvements include the placement of approximately 15,000 cubic yards of sand on the county owned section of the beach from an approved upland borrow area to restore the width and historic slope/profile of this beach. The total estimated cost for this project is $882,750.

12.24.2 Background and Project Description

The Trustees propose to improve and enhance the beach at Shell Point in Wakulla County (see Figure 12-49 for proposed project nourishment areas). The State Legislature adopted the Florida Beach and Shore Preservation Act in 2003 (section 161.011-161.242 and section 161.25-161.45, Florida Statutes) to preserve and manage Florida's valuable beach system. Beach nourishment, the placing of dredged sand from approved borrow areas, is one important management technique for maintaining these beach systems that is specifically endorsed as part of the suite of management actions identified in this act (section 161.091, Florida Statutes).

The objective of the proposed project is to enhance and/or increase recreational beach use opportunities by improving the county owned section of the beach. The restoration work proposed involves the placement of approximately 15,000 cubic yards of sand on the county owned section of the beach from an approved upland borrow area to restore the width and historic slope/profile of this beach. The length of beach overall, including county and privately owned lands, is approximately 1 mile, with an approximate overall area of about 4.5 acres.

Figure 12-49. Proposed Location for the Shell Point Beach Nourishment Project (county owned lands defining the project renourshment area are in green).

12.24.3 Evaluation Criteria

This proposed project meets the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and related response actions, the public's access to and enjoyment of the natural resources along Florida's Panhandle was denied or severely restricted. The proposed Shell Point Beach Nourishment project is intended to enhance and/or increase recreational beach use opportunities by improving the county owned section of the beach. The project would enhance and/or increase opportunities for the public's use and enjoyment of the natural resources, helping to offset adverse impacts to such uses that resulted from the Spill. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

The project is technically feasible and utilizes proven techniques with established methods and documented results and can be implemented with minimal delay. Florida agencies have successfully completed projects of similar scope throughout Florida over many years. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Furthermore, the cost estimates are based on similar past projects and therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.24, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.24 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). This proposed project is not anticipated to negatively affect regional ecological restoration and is therefore not inconsistent with the long-term restoration needs of the State of Florida. See Section 6d of the Framework Agreement.

Many recreational use projects, including ones similar to this project, have been submitted as restoration projects on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Shell Point Beach Nourishment project also meets the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by response and SCAT activities for the Spill.

12.24.4 Performance Criteria, Monitoring and Maintenance

As part of the project cost, monitoring will be conducted to ensure project plans and designs were correctly implemented. Monitoring has been designed around the project goals and objectives. The project objective is to enhance and/or increase recreational beach use opportunities by improving the county owned section of the beach. Performance monitoring will evaluate the renourishment of the beach. Specific success criteria include: 1) the completion of the renourishment as designed and permitted, and 2) enhanced and/or increased access is provided to the natural resources, which will be determined by observation that the beach is open and available.

Long-term monitoring will be completed by Wakulla County. Funding for monitoring is not included in the previously provided value for the project cost and will be accomplished by Wakulla County.

Wakulla County will monitor the recreational use activity at the site. Wakulla County will visit the site twice a year to count the number of users at the beach. The visitation numbers will then be provided to the Florida Department of Environmental Protection.

12.24.5 Offsets

The Trustees and BP negotiated a BCR of 2.0 for the proposed recreational use project. NRD Offsets are $1,765,500 expressed in present value 2013 dollars to be applied against the monetized value of lost recreational use provided by natural resources injured in Florida, which will be determined by the Trustees' assessment of lost recreational use for the Oil Spill. Please see Chapter 7 of this document (Section 7.2.2) for a description of the methodology used to develop monetized Offsets.[32]

[32] For the purposes of applying the NRD Offsets to the calculation of injury after the Trustees' assessment of lost recreational use for the Spill, the Trustees and BP agree as follows:

- The Trustees agree to restate the NRD Offsets in the present value year used in the Trustees' assessment of lost recreational use for the Spill.

12.24.6 Cost

The total estimated cost to implement this project is $882,750. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and contingencies.

- The discount rate and method used to restate the present value of the NRD Offsets will be the same as that used to express the present value of the damages.

12.25 Shell Point Beach Nourishment: Environmental Review

The proposed Shell Point Beach nourishment project includes the placement of approximately 15,000 cubic yards of sand on the county owned section of the beach from an approved upland borrow area to restore the width and historic slope/profile of this beach.

12.25.1 Introduction and Background

In April 2011, the Natural Resource Trustees (Trustees) and BP Exploration and Production, Inc. (BP) entered into the Framework Agreement for Early Restoration Addressing Injuries Resulting from the Deepwater Horizon Oil Spill (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is underway. The Framework Agreement is intended to expedite the start of restoration in the Gulf in advance of the completion of the injury assessment process. Early restoration is not intended to, and does not fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects would be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement for Early Restoration Addressing Injuries Resulting from the Deepwater Horizon Oil Spill (Framework Agreement), the Trustees released, after public review of a draft, a Phase I Early Restoration Plan (ERP) in April 2012. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, the National Oceanic and Atmospheric Administration (NOAA) issued a public notice in the Federal Register on behalf of the Trustees announcing the development of additional future Early Restoration projects for a Draft Phase III Early Restoration Plan (ERP). This boat ramp project was submitted as an Early Restoration project on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida. In addition to meeting the evaluation criteria for the Framework Agreement and the Oil Pollution Act (OPA), the project meets Florida's criteria that Early Restoration projects occur in the eight-county Florida panhandle area that deployed boom and was impacted by the Spill.

The Trustees propose to improve and enhance the beach at Shell Point in Wakulla County. The Florida State legislature adopted the Florida Beach and Shore Preservation Act in 2003 (section 161.011-161.242 and section 161.25-161.45, Florida Statutes) to preserve and manage Florida's valuable beach system. Beach nourishment, the placing of dredged sand from approved borrow areas, is one important management technique for maintaining these beach systems that is specifically endorsed as part of the suite of management actions identified in this act (section 161.091, Florida Statutes). The objective of the proposed project is to enhance and/or increase recreational beach use opportunities by improving the county owned section of the beach. The restoration work proposed involves the placement of approximately 15,000 cubic yards of sand on the county owned section of the beach from an approved upland borrow area to restore the width and historic slope/profile of this beach.

The proposed project would enhance people's beach visits, the quality and quantity of which were diminished during the Deepwater Horizon (DWH) oil spill and response operations. The project would enhance the quality of human recreational activity in the restored areas. Benefits to recreational activity would commence immediately following construction and slowly diminish over the life of the project, concurrent with expected levels of beach erosion. The proposed project is expected to cost $882,750.

This cost reflects current cost estimates developed from information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and contingencies.

12.25.2 Project Location

The proposed project area is identified in Figure 12-50. The project area is located at Shell Point in Wakulla County. The length of the entire beach, including county and privately owned lands, is approximately 1 mile, with an approximate total area of about 4.5 acres.

Figure 12-50. Location of the Shell Point Beach, proposed project area is highlighted green.

12.25.3 Construction and Installation

Restoration would include placement of sand along approximately 1 mile of Shell Point Beach. Sand would be removed from existing permitted and licensed commercial upland borrow site(s) in Gadsden County, Florida, using appropriate heavy equipment (e.g., dump trucks). The borrow sites are located approximately 45 miles northwest of Shell Point Beach project site. The proposed borrow sources are currently owned and operated by Roberts Sand Company and Anderson-Columbia Construction. Figure 12-51 shows the location of the borrow pits, the proposed transport route, and the location of the project site. The sand mines or borrow pits are permitted by the Florida Department of Environmental Protection (FDEP) Bureau of Mines and licensed by the Florida Department of Business and Professional Regulation.

Sand used as part of this project would comply with requirements set forth in Florida DEP (DEP Rule 62B-41.007). The rule requires that any material placed on a Florida beach "maintains the general character and functionality of the material occurring on the beach and in the adjacent dune and coastal system" (62B-41.007(2)(j). Sand placed at Shell Point would comply with all Florida DEP regulations, and Florida DEP would be consulted to ensure that the sand source is acceptable and all guidelines are properly adhered to.

The sand would be transported by tri-axle dump trucks with a carrying capacity of 18 to 19 cubic yards. All of the trucks would transport the sand along existing paved State or County maintained highways (Figure 12-51). All roadways and bridges traversed are permitted for the weight loads of the full trucks. The majority of the route is through rural lightly populated areas of Gadsden, Leon, and Wakulla counties and the Apalachicola National Forest (Leon and Wakulla County). Total number of trips is estimated at 790, and estimated average round trip time from loading, travel, discharge, and return is 2.5 hours. All transport of materials would be during normal daylight hours.

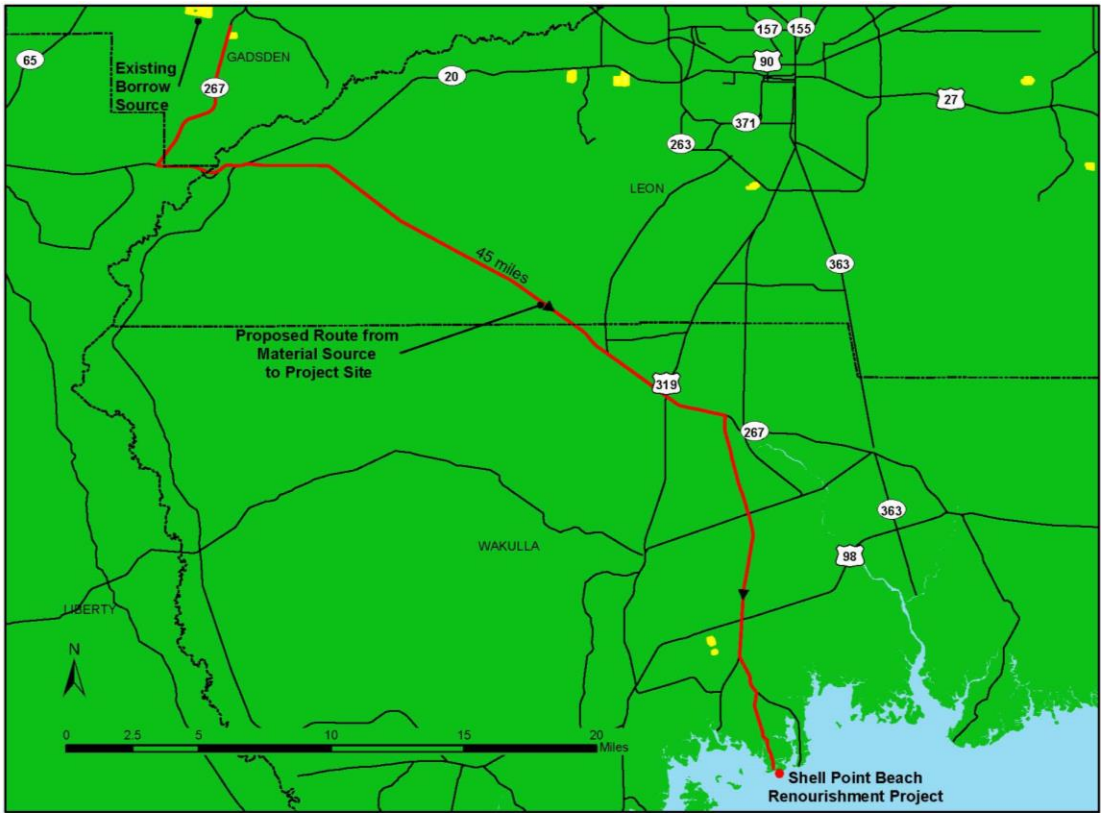

Figure 12-51. Location of Upland Borrow Site(s).

Once the sand has been transported to the project site, the sand would then be placed on Shell Point Beach using bulldozers and/or frontend loaders. Best management practices (BMPs) for shoreline and beach work would be employed to ensure that natural resources are minimally disturbed during restoration activities. The berm width would range between 25 and 50 feet at a constant elevation of +4.0 feet, NAVD 1988 and be graded to the landward edge of the mean high water line at varying slopes (Figure 12-52). Based on this beach fill shape, the potential for the direct impact of sea grasses would be avoided.

After appropriate permits are issued, restoration actions would be completed within approximately 18 months (Spring 2015).

To the extent possible, on-site project activity will be scheduled for between May 15 and July 15 to minimize impacts to sensitive species such as piping plover and red knot.

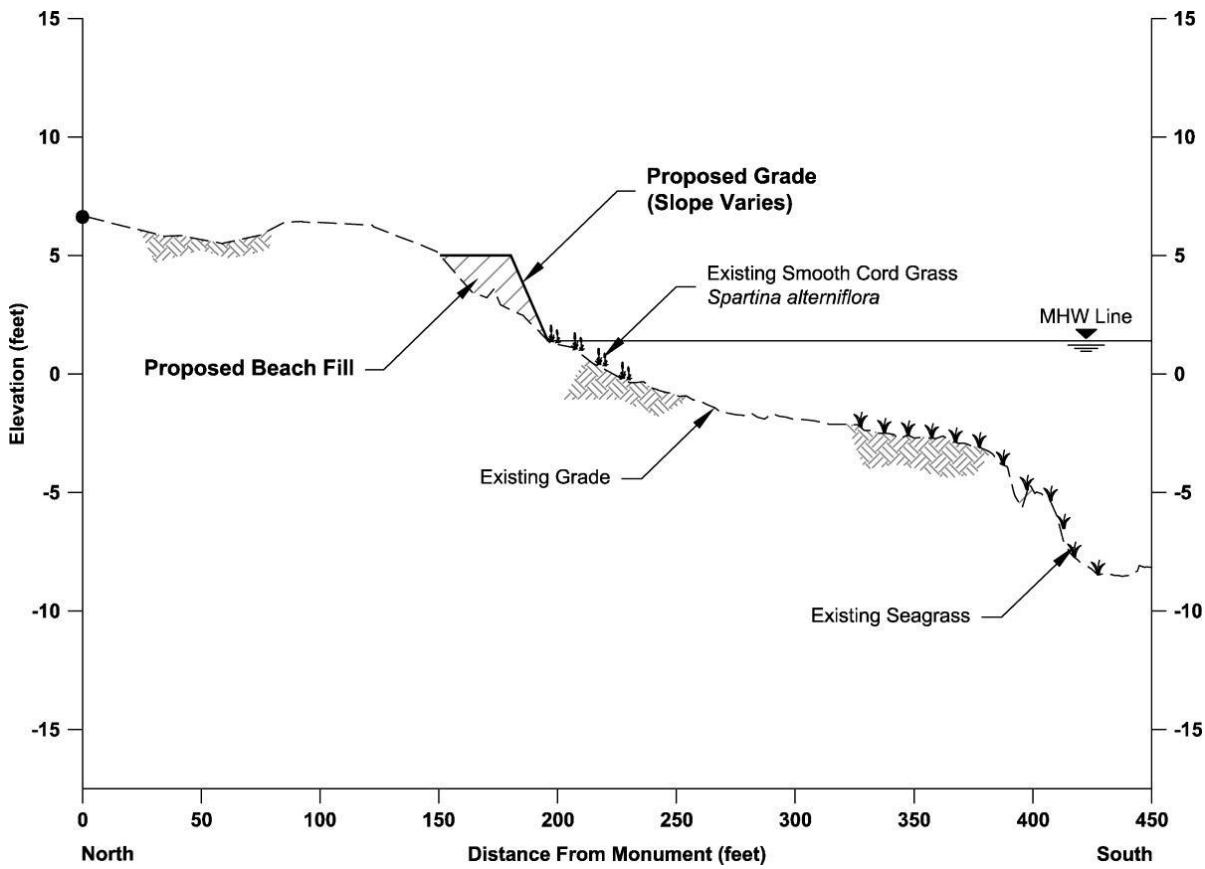

Figure 12-52. Typical cross section of proposed beach nourishment.

12.25.4 Operations and Maintenance

Operation and maintenance for this project would include pre- and post-restoration monitoring and long- and short-term maintenance. Pre-restoration monitoring would focus on reconnaissance to identify tar balls at the proposed project area. Pre-restoration monitoring would also include monitoring for threatened, endangered, and special status species, both floral and faunal.

Post-restoration monitoring would evaluate renourishment of the beach. Specific success criteria include: 1) the completion of renourishment as designed and permitted; and 2) enhanced and/or increased access to natural resources, which would be determined by observation that the beach is open and available.

Long-term monitoring would be completed by Wakulla County. Funding for monitoring would not be included in the previously provided value for the project cost and would be accomplished by Wakulla County. Wakulla County would monitor the recreational use activity at the site. Wakulla County would visit the site twice a year to count the number of users at the beach. The visitation numbers would be provided to the FDEP.

Short-term maintenance activities would be conducted as required by permits (which have not yet been pursued because design plans have not been finalized).

Long-term maintenance would include adding more sand to the site as necessary.

12.25.5 Affected Environment and Environmental Consequences

12.25.5.1 No Action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

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

12.25.5.2 Physical Environment

12.25.5.2.1 Geology and Substrates

Affected Resources

The Apalachee Bay coastal area is characterized by an irregular shoreline surrounded by low intertidal wetlands overlain on sand and mud substrate, and bisected by a number of tidal creeks (USACE 1965). Shell Point is a southward projecting peninsula located along the center portion of the Wakulla County and Apalachee Bay shoreline (DEP 2006), and is surrounded by an extensive wetland system. The southern gulf front is fronted by a narrow sandy beach. A number of coastal protection structures have been constructed along the Shell Point shoreline over the recent years to slow erosion and provide a level of storm protection. A shallow broad shoal is present to the south of Shell Point with elevations of less than -3 feet, NAVD 1988.

Environmental Consequences

The proposed project provides a cleaner and more attractive shoreline for beach users and visitors. However, this alternative does not increase the beach's ability to reduce storm damage, mitigate for current erosion trends, or provide upland protection from storm induced tidal surge. The storm surge elevation for the project area for a 10-year return interval is +8.6 feet, NAVD 1988. The typical berm elevation along this shoreline is less than +5 feet, NAVD 1988 and therefore the beach would be typically over-topped by a 10-year or greater storm event potentially causing sediment to be overwashed into upland areas. As a result, local, long-term, beneficial impacts are expected, even though a 10-year or greater storm event could potentially cause sediment to be overwashed into upland areas.

12.25.5.2.2 Hydrology and Water Quality

Affected Resources

Hydrology at Shell Point Beach is characterized by the natural beach habitat and residential development present in the uplands immediately adjacent to the beach. Water quality is similarly influenced by the adjacent residential development. Water quality may still be compromised as a result of tar that is occasionally deposited on the beach.

The Florida Department of Health's (FDOH's) "Florida Healthy Beaches Program" is responsible for conducting beach water sampling for enterococci and fecal coliform bacteria for 34 coastal Florida counties, including Wakulla County, and reporting the results to the public every week. Based on data collected by the Healthy Beaches Program, Shell Point Beach has experienced "good" water quality from September 2012 through September 2013 (FDOH 2013). "Good" water quality is defined as water that has between 0 and 35 colony-forming units of Enterococcus per 100 ml of water.

Environmental Consequences

Restoration of Shell Point Beach would have minimal beneficial impacts on hydrology and water quality. The project would be designed to restore natural beach habitat, reversing the impacts of erosion. All appropriate permits would be obtained and work would adhere to conditions, permit requirements, and BMPs to ensure that any potential adverse impacts are minimized. The project would not be expected to have an adverse impact on water quality because work would take place in the uplands, and no in-water work is planned. The proposed project is not anticipated to require authorization by the U.S. Army Corps of Engineers (Corps) pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA).

12.25.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

Air quality at Shell Point Beach is characterized by the adjacent residential development and boat traffic in Apalachee Bay and the Gulf of Mexico. Generally, air quality in the area is good and is consistent with that developed residential area. Air quality within the Florida panhandle is in attainment with the National Ambient Air Quality Standards (USEPA 2013). To determine if an area meets the ozone standard in 2012, data from 2009, 2010 and 2011 are needed to determine an area's attainment status with the 8-hr ozone standard. If the average is higher than 75 parts per billion, the area would not meet the ozone standard. In Wakulla County, Florida, the 2012 year-to-date 3 year average is 65 parts per billion, thus meeting attainment status (FDEP 2013).

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

and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (USEPA 2010). CO2 is the major GHG emitted, and the burning of fossil fuels accounts for 81 percent of all U.S. GHG emissions (USEPA 2010). Source of GHG are typical for this part of Florida with emissions from vehicles, construction, and industrial activities, in addition to natural sources.

Environmental Consequences

Restoration of Shell Point Beach would have a short-term, minor adverse impact on air quality and GHG emissions during construction activities. Use of heavy equipment (dump trucks and bulldozers) to place sand on the beach would result in a temporary increase in emissions contributing to the areas air quality. However, the project would not result in a change in air quality status or exceed air quality criteria pollutant levels thereby resulting in a short term adverse impact.

The total number of trips used by dump trucks to transport the sand from the upland borrow area is estimated at 790 trips, and estimated average round trip time from loading, travel, discharge and return is 2.5 hours (resulting in 1,975 total hours). The following table (Table 12-61) provides GHG emissions estimates for dump trucks and bulldozers, which would likely be the only heavy equipment used for this project. The dump truck emission total is based on an estimated 1,975 hours of operation over the life of the project. The bulldozer emission total is based on 640 hours of operation (based on the estimation that it would take up to 4 months with a 5-day work week). A "minor impact" on air quality can be determined if the contributions to GHGs of this project are measurable, but fall below 25,000 metric ton/year of CO2 or its equivalent.

Table 12-61. Estimated greenhouse gas emissions for equipment to be used.

EQUIPMENT[33]	CO2 (METRIC TONS)[34]	CH4 (CO2E) (METRIC TONS)[35]	NOX (CO2E) (METRIC TONS)	TOTAL CO2E (METRIC TONS)
Dump Truck	83.94[36]	0.05	0.50	83.94
Bulldozer	30.4	0.02	0.16	30.4
TOTAL	114.34	0.07	0.66	114.34

Based on the assumptions described in Table 12-61 above, and the small scale and short duration of the construction portion of the project, predicted GHG emissions would be short-term and minor and would not exceed 25,000 metric tons per year. The impacts would be lessened over the long term as maintenance activities would be limited.

12.25.5.2.4 Noise

Affected Resources

The natural ambient noise level is the aggregate of all the natural sounds that occur in the Shell Point Beach area. The natural sounds occurring in the Shell Point Beach area include those generated by wind,

[33] Emissions assumptions for all equipment based on 8 hours of operation.

[34] CO_2 emissions assumptions for diesel and gasoline engines based on USEPA 2009.

[35] CH_4 and NOx emissions assumptions and CO_2e calculations based on USEPA 2011.

[36] Construction equipment emission factors based on USEPA NONROAD emission factors for 250hp pieces of equipment. Data were accessed through the California Environmental Quality Act Roadway Construction Emissions Model.

waves, and the residential community. Noise in the Shell Point Beach area also includes the sound generated by barge and boat traffic, and vehicles in the area. Overall, the existing ambient noise in the project area is consistent with a coastal residential area.

Environmental Consequences

Restoration of Shell Point Beach would have short-term, minor adverse impacts on noise during construction. Placing sand would require the use of heavy trucks and equipment, which would increase the amount of noise at and near the beach for the duration of restoration work. The noise associated with construction equipment would attract attention but would not dominate adjacent areas, though some user activities could be affected as a result of increased noise. Shell Point is predominantly a residential area, with some vehicle traffic noise caused by both cars and boats. The beach nourishment project would make use of heavy equipment, such as dump trucks and bulldozers, which would be nosier than vehicles that typically frequent the area. Thus, the noise caused by construction may be somewhat disruptive to beach users and nearby residents. BMPs would be followed to ensure that noise disturbance is minimized, such as only performing nourishment activities during normal daylight hours.

The project would not have long-term adverse impacts to noise because the project scope is limited to placing new sand on the beach area. Noise impacts related to maintenance would be minimal.

12.25.5.3 Biological Environment

12.25.5.3.1 Living Coastal and Marine Resources

Affected Resources

Shell Point Beach is a sandy beach on Apalachee Bay on the Gulf of Mexico. The upland area immediately adjacent to the beach is a residential development. The project area includes some areas of fairly common vegetation such as smooth cord grass. There are no nesting bird colonies at the site; nor are solitary birds known to nest in the area.However, wintering piping plovers, red knots and and migratory birds may occasionally visit the site to rest and forage. Additional state-listed species may also occur in the area. Sea turtles are not known to nest on this beach.

Protected Species

The Trusteeshave reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS. For this, the Trusteesfirst reviewed the species list for Wakulla County, Florida[37]. Table 12-62 presents a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

[37] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

Table 12-62. Potential Impacts to Species/Critical Habitats managed by USFWS

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle[a], Hawksbill turtle[a], Kemp's ridley turtle; Leatherback turtle[a], Loggerhead turtle	Sea turtles are not known and have not been documented to nest on this beach; according to information available from the Florida Sea Turtle Nesting Beach Monitoring Program (see http://ocean.floridamarine.org/SeaTurtle/nesting/FlexViewer/). Therefore no impacts to any sea turtle species are anticipated No designated or proposed critical habitat for sea turtles occurs within the action area; therefore, none will be adversely affected or modified.
Piping plover	In 2009, observations of at least one piping plover were reported within or near the action area (ebird.org as of October 4, 2013). The main risk to Piping plovers is from human disturbance while resting or foraging in habitats within the action area. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the plovers to move to a nearby area and resume normal behaviors. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The proposed project will bury existing shoreline habitats where piping plover could be feeding or resting. Burying of the habitat will make it temporarily unsuitable for foraging as it may take 6 months to two years for infauna prey items to return to pre-project levels. Habitat should be available for resting upon the completion of the project. Piping plover critical habitat is not designated in or near the action area.
Red knot	There are no documented records of red knot using the project area (ebird.org as of October 4, 2013). This likely reflects the highly manipulated nature of the habitat on this beach associated with the development of the community and the presence of nearby habitats. However, potential wintering/migration foraging and resting habitat are present in nearshore habitats (sand bars/mudflats), generally within a half mile of the project location. The main risk to Red knots is from human disturbance while resting and foraging in nearshore habitats close to work areas. The proposed project could result in short term increases in noise which could startle nearby individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the red knots to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The proposed project will not result in any changes to habitats where red knot could be feeding or resting.

Based on the Trustees'reviews of project materials (Spring 2013) in coordination with representatives from NOAA's Protected Resource Division (PRD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project falls outside of NMFS Endangered Species Act (ESA) jurisdiction, as it does not contain suitable habitat for species managed by NMFS. As a result, the project did not require further ESA evaluation from NOAA.

Migratory Birds and Bald Eagles

The proposed project was also reviewed for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), respectively. Table 12-63 provides a summary of the different migratory bird groups specifically addressed by this review and summarizes the potential impacts to these groups and associated habitats that could result from the implementation of this project.

Table 12-63. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Shorebirds/seabirds	Foraging, feeding, resting	Shorebirds forage, feed, and rest, and in the types of habitats consistent with the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. Nesting is not known in the project area. Therefore the Trusteesdo not anticipate impacts.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in Table 12-64.

Table 12-64. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Shorebirds/sea birds	To avoid impacts to any foraging or resting migratory birds, the following measures will be implemented: - Driving on the beach for construction shall be limited to the minimum necessary within the designated travel corridor, which will be established just above or just below the primary "wrack" line. - Predator-proof trash receptacles shall be installed and maintained during construction at all beach access points used for the project construction to minimize the potential for attracting predators of migratory birds. - Workers shall be briefed on the importance of not littering and keeping the project area trash and debris free. - Educational signs shall be installed at public access points within the project area with emphasis on the importance of the beach habitat and wrack line for migratory birds. - When the project area has a pet or dog regulation, the provisions of the regulation shall be included on the educational signs.

Essential Fish Habitat

EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. Based on the Trustees'reviews of project materials (Spring 2013) in coordination with representatives from NOAA's Habitat Conservation Division (HCD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project will not affect EFH because there is no EFH in the project area. As a result, the project did not require further EFH evaluation.

Environmental Consequences

Protected Species

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On February 6, 2014 the review of potential impacts to species managed by USFWS was completed (Reynolds, 2014). The USFWS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect piping plover and red knot (if listed). The USFWS review also concurred with the Trustees'determination that the proposed project would have no effect on five species of sea turtles in terrestrial habitats (green, hawksbill, Kemp's ridley, leatherback, and loggerhead).

Migratory Birds and Bald Eagles

Bald eagles are not present at the project location so will not be affected. At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

Invasive Species

Affected Resources

Non-native invasive species could alter the existing terrestrial or aquatic ecosystem within, and possible expand out into adjacent areas after the initial introduction. The invasive species threat, once realized, could result in economic damages. Prevention is ecologically responsible and economically sound. Chapter 3 described more about the regulations addressing invasive species, pathways, impacts, and prevention. At this time specific invasive species that may be present on the project site or could be introduced through the project have not yet been identified.

Environmental Consequences

Best Management Practices (BMPs) to control the spread of any invasive species present, and prevent the introduction of new invasive species due to the project will be implemented. In general, best management practices would primarily address risk associated with vectors (e.g., construction equipment, personal protective equipment, delivery services, foot traffic, vehicles/ vessels, shipping material). There are many resources that provide procedures for disinfection, pest-free storage, monitoring methods, evaluation techniques, and general guidelines for integrated pest management that can be prescribed based upon specific site conditions and vectors anticipated. In addition, to best management practices, outreach and educational materials may be provided to project workers and potential users/visitors. . Other measures that could be implemented are identified in the Chapter 6 Appendix. Due to the implementation of BMPs, the Trusteesexpect impacts due to invasive species introduction and spread to be short term and minor.

12.25.5.4 Human Uses and Socioeconomics

12.25.5.4.1 Socioeconomics and Environmental Justice

Affected Resources

Wakulla County is the fourth fastest growing county in the state of Florida. Wakulla County has experienced a 60% increase in population over the past decade compared to the state's average growth

rate of 24%. In 1990, the population of Wakulla County was approximately 14,000. The estimated population in 2002 was 24,338 and in 2004 it is estimated to be over 26,000 (Wakulla County Health Department 2004).

U.S. Census data from 2000 estimates reported 11,035 Wakulla County residents over the age of 16 employed in the labor force with 5,839 being males and 5,196 females. It is estimated that nearly two-thirds of all parents work outside the home. In 2000, Wakulla County's unemployment rate was 3.9%, below both the state and national rate. The unemployment rate in the late 1990s was lower at 2.9%. Wakulla's current unemployment rate is 3.4% while the national unemployment rate is 5.5% (Wakulla County Health Department 2004).

Environmental Consequences

The proposed project would be expected to have short-term, beneficial impact on socioeconomics for the project area and adjacent areas, based on a slight increase in the workforce required to perform the beach nourishment project. The exact number of persons to be employed by this project is undetermined, but would be expected to be low. Additionally, the project would be expected to have long-term beneficial impacts to socioeconomics in the region, due to expected increases in tourism to the area. With the improvements made by the proposed project, it is expected that more people will visit the area, thus directly benefiting the local economy. The proposed project would not adversely affect any low income or minority populations.

12.25.5.4.2 Cultural Resources

Affected Resources

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Environmental Consequences

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

12.25.5.4.3 Infrastructure

Affected Resources

No infrastructure is present at Shell Point Beach. The upland area is a residential development with paved roads and defined lots. The total number of trips used by dump trucks to transport the sand from the upland borrow area is estimated at 790 trips. The dump trucks would travel primarily through rural lightly populated areas of Gadsden, Leon, and Wakulla counties and the Apalachicola National Forest.

Environmental Consequences

Renourishment of Shell Point Beach would not impact infrastructure associated with the project area, only natural beach areas would be restored and equipment used to complete restoration would access the site via existing roadways. There would likely be short-term minor adverse impacts related to the transport of sands to the project site, as traffic would increase, though no additional traffic delays would occur. These impacts would cease after all materials are delivered to the project area.

12.25.5.4.4 Land and Marine Management

Affected Resources

Shell Point Beach is managed by the Wakulla County Department of Parks and Recreation. The project area is zoned as a "public beach area." Upland of the project area is a residential community, zoned as R1 – Single family residential. In addition, the Florida Beach and Shore Preservation Act guides beach management activities.

Environmental Consequences

Renourishment of Shell Point Beach is consistent with local zoning and the Florida Beach and Shore Preservation Act and would result in long-term beneficial impacts on land and marine management. Beach restoration is designed to improve the ecologic condition of the beach habitat, which would benefit biota and resource managed by public agencies. Further, the improvements to the beach are expected to improve the recreational value of the site, which would benefit Wakulla County's management of the site.

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS (Federal Trustees 2013). The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process (Milligan 2014).

12.25.5.4.5 Aesthetics and Visual Resources

Affected Resources

The existing aesthetic and visual resources include the natural beach and Gulf of Mexico habitat. These resources are enjoyed by residents in the adjacent community and tourists or recreationists who visit the beach.

Environmental Consequences

Project construction activities would have short term moderate adverse impacts on associated visual resources as the presence of bulldozers and dump trucks would attract attention and would detract the experience of current users, especially those residents accustomed to the views. Nourishment of Shell Point Beach would have a long-term beneficial impact on aesthetic and visual resources at the project area. The project is designed to restore the beach habitat and would reverse damage done by erosion and sand removal following the DWH oil spill.

12.25.5.4.6 Tourism and Recreational Use

The site is currently used by local residents and tourists for recreation. Many residents access the beach from their property, and other users may access the beach from public areas. The main access to the project area is via Shell Point Road, which runs North/South perpendicular to the beach.

Environmental Consequences6

Nourishment of Shell Point Beach would have a long-term beneficial impact on tourism and recreational use. Restoration of the beach would improve the recreational experience by restoring the beach to its historic condition. Users would experience short-term minor to moderate adverse impacts during the construction period, as visitors would be prohibited from entering certain areas or the project area in its entirety. However, beach nourishment would result in long-term enhanced opportunities for future use.

12.25.5.4.7 Public Health and Safety and Shoreline Protection

Affected Resources

There are no existing hazardous waste or disposal facilities at or near Shell Point Beach. The beach has been affected by the DWH oil spill, and occasionally tar balls are observed on the beach.

Environmental Consequences

Nourishment of Shell Point Beach would have no impact on public health and safety or shoreline protection. The project would replace sand that has been lost over time but cannot prevent the occurrence of tar balls that reach the beach from the Gulf of Mexico and would not otherwise change the site in a way that affects public health and safety or shoreline protection activities.

Sediment would be evaluated prior to placement. Excavation is not involved so no new contaminated areas should be uncovered during work. If areas of concern are identified during the construction they would be evaluated and the response will be determined based on any testing results and the options those results define. Once permits are issued, specific permit conditions should be included that set the sediment controls for each project such as geotechnical parameters of the sand, grain size, color spectrum, silt content.

Standard conditions in state contracts for addressing hazardous and toxic materials include:

1. All paints, solvents, chemicals and petroleum products used stored on site would be contained so that any leakage or spills that may occur do not run off into surrounding properties or waterways. All leaks or spills would be promptly cleaned up, and all absorbent materials used would be promptly removed from the site and properly disposed to an appropriate facility. Any spills would be reported to the FDEP.
2. The contractor would have sufficient number and size of waste container(s) on site for the proper disposal of all waste material generated during construction activities. The contractor would remove or have waste containers emptied and waste material disposed to a properly licensed facility when full and all containers must be removed at the conclusion of construction.
3. If during the course of performing the work the Contractor uncovers unsuitable or contaminated material he shall cease work in that area and notify the FDEP. A site assessment report and remedial action plan would be prepared and approved by the FDEP before any further activity or construction in the affected area is resumed.

Temporary signage and other access controls may be placed to indicate the beach is effectively the site of an active construction project where heavy equipment is being operated, which would mitigate risks to human safety during construction.

12.25.6 Summary and Next Steps

The proposed Florida Shell Point Beach Nourishment project would involve the renourishment of Shell Point Beach in Wakulla County. The proposed improvements include the placement of approximately 15,000 cubic yards of sand on the beach from an approved upland borrow area to restore the width and historic slope/profile of this beach. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

Draft NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would enhance and/or increase recreational beach use opportunities by improving the county owned section of the beach. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

12.25.7 References

Federal Trustees, 2013. Letter to Kelly Samek, Coastal Program Administrator, State of Florida, December 12. Letter submitting determination for State review of consistency of Phase III early restoration actions for the Deepwater Horizon oil spill with Florida's approved Coastal Management Program.

Florida Department of Environmental Protection (FDEP)

2006 *2005 Hurricane Dennis and Hurricane Katrina Final Report on 2005 Hurricane Season Impacts to Northwest Florida.*. Division of Water Resource Management, Bureau of Beaches and Coastal Systems, 166p.

2013 Air Quality Monitoring for Wakulla County, Florida. Accessed online at: http://appprod.dep.state.fl.us/air/flaqs/selectreport.asp

Florida Department of Health (FDOH)

2013 Florida Healthy Beach Program. Water quality monitoring for Shell Point Beach, FL. Accessed online at: http://www.myfloridaeh.com/beach_sampling/dpBeach_Data_Summary_Detail_MashUp7.html?County=Wakulla&SPLocation=SHELL%20POINT&SPNo=&SPLat=30.05765875&SPLong=-84.29045457&appSession=675276987600166&RecordID=&PageID=2&PrevPageID=&cpipage=1&CPISortType=&CPIorderBy=

Milligan, L. 2014. Letter to Harriet Deal, U.S. Department of the Interior, February 28, 2014, Re: Florida Coastal Management Program Consistency for Draft Phase III ERP/PEIS projects.

Reynolds, K. 2014. Memorandum to Field Supervisor, Panama City Ecological Services Office, Subject Informal Consultation and Conference Request for the Proposed Shell Point Beach Nourishment Project, Wakulla County, Florida. Sent January 16. Concurrence signed, February 6, 2014.

U.S. Army Corps of Engineers (USACE)

1965 *Appraisal Report on Beach Conditions in Florida*.

United States Environmental Protection Agency (USEPA)

2013 Status of SIP Requirements for Designated Areas. Accessed online at: http://www.epa.gov/airquality/urbanair/sipstatus/reports/fl_areabypoll.html

Wakulla County Health Department

2004 Wakulla County Profile. Healthy People 2010 Report Card and County Health Department Strategic Plan. Accessed online at: http://www.doh.state.fl.us/compass/countyassessment/countycontent/Wakulla/Wakulla_Assessment_2004.pdf

12.26 Perdido Key Dune Restoration Project: Project Description

12.26.1 Summary Project Information

The proposed Perdido Key Dune Restoration project will restore appropriate dune vegetation to approximately 20 acres of degraded beach dune habitat in Perdido Key, Florida, including habitat used by the federally endangered Perdido Key Beach Mouse. The project will consist of planting appropriate dune vegetation (e.g., sea oats, panic grasses, cord grasses, sea purslane, beach elder) approximately 20 – 60' seaward of the existing primary dune to provide a buffer to the primary dune and enhance dune habitats. In addition, gaps in existing dunes within the project area will be re-vegetated to provide a continuous dune structure. The total estimated cost for this project is $611,234.

12.26.2 Background and Project Description

The Trustees propose to restore dune habitat in Perdido Key in an area that begins approximately 2.2 miles east of Perdido Pass at the Florida/Alabama state line and extends approximately 6 miles to the east (see Figure 12-53 for additional detail). Perdido Key is located primarily in Escambia County, is approximately 15 miles long, and extends from Pensacola Pass in the east to Perdido Pass in the west.

The objective of the Perdido Key Dune Restoration project is to restore and enhance dune habitat by planting dune vegetation. The restoration work proposed includes planting appropriate dune vegetation (e.g., sea oats, panic grasses, cord grasses, sea purslane, beach elder) approximately 20 – 60' seaward of the existing primary dune to provide a buffer to the primary dune and enhance dune habitats. In addition, gaps in existing dunes within the project area would be re-vegetated to provide a continuous dune structure. All plants would be grown from seeds or cuttings from the Alabama or North Florida coast to ensure appropriate genetic stocks are used in the project. Ultimately, the project would restore appropriate dune vegetation to approximately 20 acres of degraded beach dune habitat including some habitat used by the federally endangered Perdido Key Beach Mouse. Remaining habitat utilized in this area by the beach mouse is typically within areas that are undeveloped or in public ownership. The restoration methods proposed here are established methods for this type of restoration activity.

12.26.3 Selection Criteria

This proposed project meets the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and related response activities, dune habitat in Florida's Panhandle was adversely impacted. This proposed project seeks to restore injured dune habitat by planting new dune vegetation. The ecological benefits that would be gained by this restoration project are anticipated to help compensate the public for Spill-related injuries and losses to the dune habitat. Thus, nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

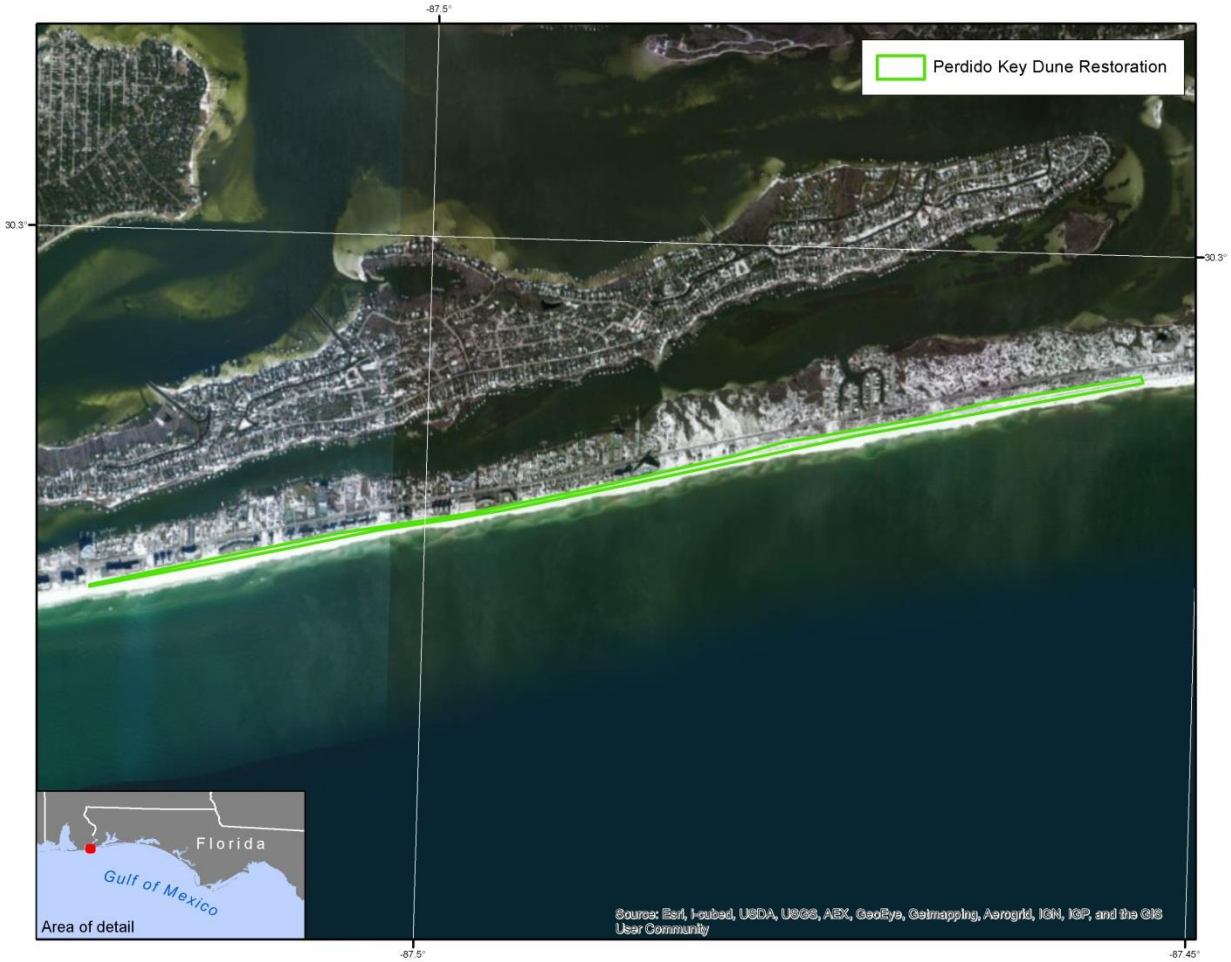

Figure 12-53. Location of envisioned Perdido Key Dune Restoration Project.

The project is technically feasible and utilizes proven techniques with established methods and documented results. Florida agencies have successfully implemented similar projects in the region, including a project in the first phase of Early Restoration (Pensacola Beach Dune Restoration). For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. Additionally, the cost estimates are based on similar past projects and therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.26, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.26 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). This project came from a list of beach re-nourishment and dune re-vegetation projects put together by the Florida Beaches and Coastal Systems program, which is part of the Florida Department of Environmental Protection. Therefore, this project is consistent with the long term restoration needs of the State of Florida. See Section 6d of the Framework Agreement.

Many ecological projects, including ones similar to this project, were submitted as a restoration project on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Perdido Key Dune Restoration Project also meets the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by response and SCAT activities for the Spill.

12.26.4 Performance Criteria, Monitoring and Maintenance

As part of the project costs, monitoring will be conducted to ensure project designs were correctly implemented and to evaluate project effectiveness. Performance criteria will be used to determine project success or the need for corrective actions. The monitoring has been designed around the project objective, which is to restore and enhance injured dune habitat. Specific success criteria include: the construction of dune habitat that meet project design criteria, achieves the designed percent cover by native vegetation, and is sustained for the expected life of the project.

Post construction performance monitoring will initially focus on plant survival. Plants that do not survive to 90 days post-planting will be replaced. At least 80% of plants must survive after 6 months or replanting will occur. There is approxiamtely $30,000 set aside for monitoring of the results of the project and plant survival. Sand fencing will be installed to protect the plants, and it will have a one year warranty period. Topographic surveys will not be necessary due to the lack of physical movement of sand, but species survival and cover will be monitored as part of this project.

Escambia County will take over maintenance of the project once survival of the plants is accomplished. Additional performance monitoring may include collection of information such as the utilization of the habitat by the Perdido Key Beach Mouse to assist with future habitat enhancement and restoration efforts focused on benefitting this species.

12.26.5 Offsets

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Habitat Equivalency Analysis to estimate appropriate habitat Offsets for the Perdido Key Dune Restoration Project. Habitat Offsets (expressed in DSAYs) were estimated for primary vegetated dune habitat enhanced by this restoration, based on the expected spatial extent, duration and degree of improvements attributable to the project in estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, benefits of re-vegetating primary dune habitat, the time period that it would take for re-vegetated habitat to provide different levels of ecological benefits, estimated project life span and the potential impact of hurricanes and drought. The Trustees and BP agreed that if this restoration is selected for implementation, BP would receive Offsets of 34.9 DSAYs of Primary Vegetated Dune Habitat A[38] in Florida, applicable to injuries to Primary Vegetated Dune Habitat A in Florida, as determined by the Trustees' total assessment of injury for the Spill and 67.3 DSAYs of Primary Vegetated Dune Habitat B[39] in Florida, applicable to injuries to Primary Vegetated Dune Habitat B in Florida, as determined by the Trustees' total assessment of injury for the Spill.

[38] Primary Vegetated Dune Habitat "A" is utilized by the Perdido Key Beach Mouse, a federally listed endangered species.

[39] Primary Vegetated Dune Habitat "B" is not utilized by the Perdido Key Beach Mouse.

Further, in the event that the injury determination for Primary Vegetated Dune Habitat A in Florida and/or Primary Vegetated Dune Habitat B in Florida is quantified in the Natural Resource Damages Assessment using a metric other than DSAYs of Primary Vegetated Dune Habitat A in Florida and/or Primary Vegetated Dune Habitat B in Florida, the Trustees agree to translate the agreed upon NRD Offsets into a currency consistent with the metric used to characterize the injury to Primary Vegetated Dune Habitat A in Florida and/or Primary Vegetated Dune Habitat B in Florida. Any necessary translation of the Offsets will rely on the data and methods developed for the assessment and authorized in 15 C.F.R. Sections 990, *et seq.*

These Offsets are reasonable for this resource and project.

12.26.6 Cost

The total estimated cost to implement this project is $611,234. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and potential contingencies.

12.27 Perdido Key Dune Restoration Project: Environmental Review

The proposed project would restore approximately 20 acres of degraded vegetated dune habitat to its natural state along Perdido Key, Florida. The project would consist of planting appropriate dune vegetation (e.g., sea oats, panic grasses, cord grasses, sea purslane, and beach elder) and installing sand fencing to enhance dune establishment.

12.27.1 Introduction and Background

In April 2011, the Natural Resource Trustees (Trustees) and BP Exploration and Production, Inc. (BP) entered into the Framework Agreement for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is under way. The Framework Agreement is intended to expedite the start of restoration in the Gulf of Mexico in advance of the completion of the injury assessment process. Early restoration is not intended to, and does not fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects would be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement, after public review of a draft, the Trustees released a Phase I Early Restoration Plan (ERP) in April 2012. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, NOAA issued a public notice in the Federal Register on behalf of the Trustees, announcing the development of additional future Early Restoration projects for a Draft Phase III Early Restoration Plan (ERP).

The Trustees propose to restore dune habitat in Perdido Key in an area that begins 2.2 miles east of Perdido Pass at the Florida/Alabama state line and extends approximately 6 miles to the east (Figure 12-54 for additional detail). Perdido Key is located primarily in Escambia County, is approximately 15 miles long, and extends from Pensacola Pass in the east to Perdido Pass in the west.

The objective of the Perdido Key Dune Restoration project is to restore and enhance dune habitat by planting dune vegetation. The restoration work proposed includes planting appropriate dune vegetation (e.g., sea oats, panic grasses, cord grasses, sea purslane, beach elder) approximately 20 – 60' seaward of the existing primary dune to provide a buffer to the primary dune and enhance dune habitats. In addition, gaps in existing dunes within the project area would be re-vegetated to provide a continuous dune structure. All plants would be grown from seeds or cuttings from the Alabama or North Florida coast to ensure appropriate genetic stocks are used in the project. Ultimately, the project would restore appropriate dune vegetation to approximately 20 acres of degraded beach dune habitat including some habitat used by the federally endangered Perdido Key Beach Mouse. Remaining habitat utilized in this area by the beach mouse is typically within areas that are undeveloped or in public ownership. The restoration methods proposed here are established methods for this type of restoration activity.

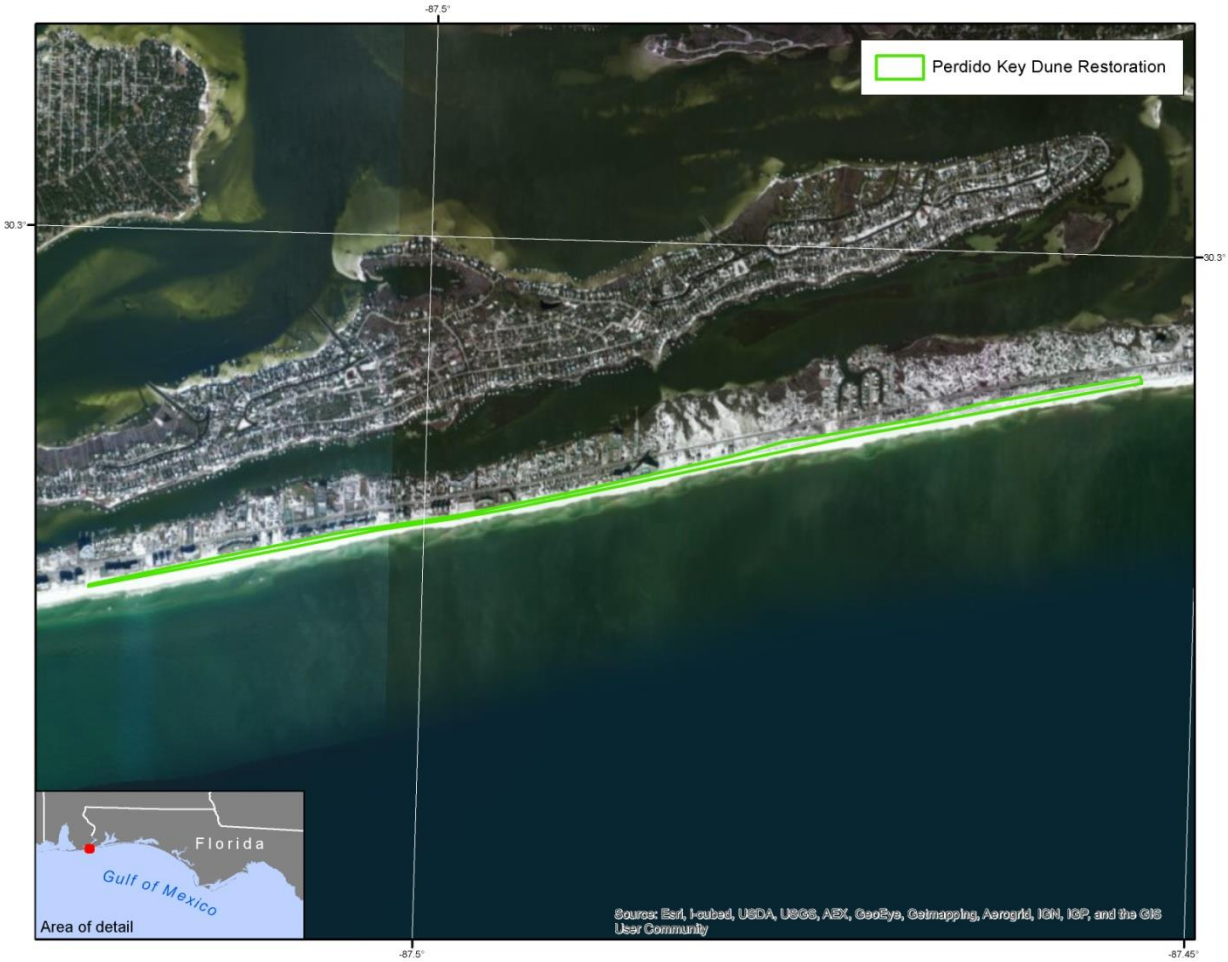

Figure 12-54. Perdido Key Dune Restoration Project Area.

There is a long history of state-supported actions to restore dunes in this area (including another Early Restoration approved Phase I project, nearby at Pensacola Beach to the east). Dune restoration in Perdido Key was suggested as a restoration measure during NOAA's public scoping meetings for the Deepwater Horizon Programmatic EIS in Florida and was submitted as a restoration project to the State of Florida. In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Perdido Key Dune Restoration Project meets Florida's additional criteria that Early Restoration projects occur in the eight-county Panhandle area that deployed boom and was impacted by response and SCAT activities for the Deepwater Horizon oil spill.

The total estimated cost to implement this project is $611,234. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and potential contingencies.

12.27.2 Project Location

The proposed project is located in the Gulf of Mexico, in Perdido Key, Florida (Figure 12-54). Perdido Key is located primarily in Escambia County and extends approximately 15 miles from Pensacola Pass in the east to Perdido Pass in the west. The project would restore dune habitat in Perdido Key in an area that

begins approximately 2.2 miles east of Perdido Pass at the Florida/Alabama state line and extends approximately 6 miles to the east (see Figure 12-54 for additional detail).

12.27.3 Construction and Installation

The proposed Perdido Key Dune Restoration project will restore appropriate dune vegetation to approximately 20 acres of degraded beach dune habitat in Perdido Key, Florida, including habitat used by the federally endangered Perdido Key Beach Mouse. This project will maximize the habitat quality of non-developed areas, within the Perdido Key State Park, and connect the habitats by landscaping with native dune plants. The landscaping plan will be reviewed and approved as appropriate for trust resource protection by the U.S. Fish and Wildlife Service prior to implementation.

The restoration project would consist of planting appropriate dune vegetation (e.g., sea oats, panic grasses, cord grasses, sea purslane, beach elder) approximately 20 to 60 feet seaward of the existing primary dune to provide a buffer to the primary dune and enhance dune habitats. Gaps in existing dunes within the project area will be revegetated to provide a continuous dune structure. The planting shall be patterned after the species composition in native communities adjacent to a project site, if possible. This vegetation would be planted using hand tools to excavate cavities where the root ball from the planting container can be placed and secured with the excavated sand/soil.

No movement of sand is envisioned for the project, but sand fencing will be installed to trap and retain wind-blown sediments and protect the plants for dune restoration purposes. Sand fencing shall be placed in a sea turtle compatible design and be made of biodegradable material. Appropriate signs to designate and indicate the purpose of the conservation area may be used if necessary. If dune vegetation is impacted during the implementation activities in some areas within the proposed project, these areas shall be restored by planting the appropriate vegetation in those areas with the same survival performance measures as the other proposed planted areas.

In accordance with Rule 62B-41.007(2)(l), Fla. Admin. Code, all vegetation used for the restoration would be native salt-resistant vegetation suitable for beach and dune stabilization, and grown from seeds or cuttings from the Alabama coast or North Florida to ensure appropriate genetic stocks are used in the project. The seedlings to be plantedshall be at least 1 inch by 1 inch with a 2.5-inch pot. Vegetation shall be planted with an appropriate amount of fertilizer and anti-desiccant material, as appropriate, for the plant size. Planting will generally be on 18-inch centers throughout the created dune; however, 24-inch centers may be acceptable depending on the area to be planted. No material is planned for removal. Sand/soil removed for plantings would be packed around the planted unit to support regrowth. Only the excavated sand/soil removed to make room for the plantings would be placed on the site and it would be used to anchor the planted vegetation. Incidental trash encountered during project activities will be removed. No irrigation lines or pipes will be installed. Post construction performance monitoring will initially focus on plant survival. Plants that do not survive to 90 days post-planting will be replaced. At least 80% of plants must survive after 6 months or replanting will occur.

The proposed restoration activities are minimally disruptive and would occur over a relatively limited time period (2 months). To protect the dune habitat, most of the proposed work would be done by hand with ATVs potentially used to shuttle plants and other materials to sites of active replanting. Access to the dunes would be established through existing emergency vehicle paths and rights-of-way. Staging

areas would be established in existing parking lots. Access to the areas would be primarily through continuous beach access along Perdido Key Drive (Rt 292), which runs adjacent to the length of the project area to the north. This form of construction equipment would have minimal impact on dune resources.

The project would be constructed over a maximum 2 month period and would operate 7 days a week for 8 to 10 hours a day, during daylight hours only. No storage of equipment or materials will occur on the beach or dunes throughout the proposed project. No activity, except as needed to plant and monitor vegetation shall occur on existing dunes during any time of the year.

12.27.4 Operations and Maintenance

State Park staff and Escambia County staff would perform operation and maintenance of the dunes, which includes keeping the area clean of debris, routine inspection and repair of sand fencing, and similar tasks.

This project would incorporate a mix of monitoring efforts to ensure project designs are correctly implemented during construction and in a subsequent period, defined by contract, where corrective actions could be taken. Monitoring would include construction monitoring and restoration success.

Thenumber of acres restored, number of dune plants installed, and survivorship of installed dune plants would be reported. Short-term maintenance activities would include periodic watering of dune plants by selected contractor, if needed, and replanting where dune plants have not survived. Specific criteria for evaluating revegetation success would be accomplished through implementation of standard state guidelines.

Post construction performance monitoring would initially focus on plant survival. Plants that do not survive to 90 days post-planting would be replaced. At least 80 percent of plants must survive after 6 months or replanting would occur. Approximately $30,000 in funding has been set aside for monitoring the results of the project and plant survival. No movement of sand would be envisioned for the project, but sand fencing would be installed to protect the plants. The sand fencing would have a one year warranty period. Topographic surveys would not be necessary due to the lack of physical movement of sand, but species survival and cover would be monitored as part of this project.

Escambia County would take over maintenance of the project once survival of the plants is accomplished. Additional performance monitoring could include collection of information such as the utilization of the habitat by the endangered Perdido Key beach mouse to assist with future habitat enhancement and restoration efforts focused on benefitting this species. This information collected as part of this monitoring effort would help evaluate the project's performance over time with respect to the proposed project Offsets.

12.27.5 Affected Environment and Environmental Consequences

12.27.5.1 No Action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

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

12.27.5.2 Physical Environment

The physical environment describes the geology and substrate, hydrology and water quality, air quality and noise characteristics of the Gulf of Mexico, including the upland, nearshore, and offshore environments, both freshwater and saltwater. The nearshore environment comprises the coastline and the inner continental shelf. Specifically, nearshore environments extend from inland tidally influenced freshwater ecosystems, including coastal sand dune habitats, to 600 feet in depth off the Gulf Coast.

12.27.5.2.1 Geology and Substrates

Affected Resources

The existing geology and substrates of Perdido Key consist of gently sloping sandy beaches along a barrier island shoreline. The geologic setting of Perdido Key is more similar to the coastal areas of neighboring Alabama and Mississippi to the west rather than the majority of the Florida carbonate platform to the east (Olsen 2006). Perdido Key lies within the East Gulf Coastal Plain physiographic region (USGS 2008) and is within the Florida Coastal Lowlands ecoregion (USFS 2008). The predominant landform is a flat, weakly dissected alluvial plain formed by deposition of continental sediments onto a submerged, shallow continental shelf. This shelf was later exposed by sea level subsidence. Along the coast, fluvial deposition and shore zone processes are active in developing and maintaining beaches, swamps, and mud flats. Elevations within the Florida Coastal Lowlands ecoregion range from 0 to 80 feet (USFS 2008) and are noted to range between 0 to 25 feet on Perdido Key.

Perdido Key is predominantly a flat barrier island feature, containing old dune ridges with areas exhibiting surface modification by erosion and underground solution. The majority of the Gulf of Mexico coastlines in northwest Florida (similar to Perdido Key) include barrier islands, mainland beaches, and peninsulas. These dynamic ecosystems are subjected to diverse coastal processes including: climate, geomorphology, sediment deposition, littoral drift in ocean currents, tides, wind, saltwater and spray, erosion, and tropical storms. As described above, Perdido Key is a barrier island with limited elevation and relatively narrow width.

The soils of beach dunes are composed primarily of deep siliceous or calcareous sands which drain rapidly and create xeric conditions. Four distinct soil types occur within the Perdido Key project vicinity; Beaches (found south of Perdido Key Drive), and Newhan-Corolla complex, Dirego muck, and Corolla-Duckston sands (found north of Perdido Key Drive). The existing, native sands of Perdido Key are fine to medium grained sands that are very well sorted. Beach dunes are subject to drastic topographic alterations during winter and tropical storms which have resulted in overwash from the beaches along the Key and direct loss of dune vegetation and habitat.

Environmental Consequences

The project would have a no adverse impact on geology since all restoration work would be confined the dune area and no additional fill or excavation would be necessary to accomplish the goal of the restoration. Typically, this type of construction does not require erosion control measures beyond the proposed sand fencing. However, if it is determined that erosion control measures are warranted, it

would be required as a part of any permitting process and would be maintained by the construction contractor throughout construction activities and would be monitored by the contracting authority (the Florida DEP). Native plants would be installed using hand tools, which would not cause short-term or long-term adverse impacts to geology and substrates. Revegetation and sand fencing would have major beneficial short- and long-term impacts by reducing erosion of the dune habitat and encouraging future dune development. All appropriate permits would be obtained prior to begin of construction and all BMPs and conditions set forth would be followed. After restoration is complete, no long-term impacts would be anticipated as the project would take place within the existing footprint of the original dunes. As a result of the proposed project, impacts to geology and substrates would likely be short-term and negligible.

12.27.5.2.2 Hydrology and Water Quality

Affected Resources

The hydrology of northwestern Florida is very complex. Deposits are predominantly marine in origin and generally dip toward the south. Although the strata range from Paleozoic to Recent, only those deposited during the past 60 million years are important for groundwater resources (DEP 2006). The typical hydrogeologic sequence in this area consists of predominantly sandy materials in the uppermost deposits. These geologic units contain the Sand and Gravel Aquifer. Underlying these upper sandy deposits are variable thickness of generally clayey materials that function primarily as confining beds. Beneath this zone is the Floridan Aquifer, which is composed of several massive formations of carbonate rocks that exhibit highly variable water-bearing characteristics.

Hydrology at the project site is predominantly natural and water quality is good. The surface waters of the region are a valuable resource and generally support an abundance of wildlife and aquatic life. Water quality problems found in some areas of the region are high concentrations of nutrients and coliform bacteria likely caused by domestic and industrial waste discharges, natural swamp drainage and urban and agricultural runoff.

Perdido Key is located at the mouth of the Perdido River, a designated Outstanding Florida Waters river under authority of Section 403.061 (27), Florida Statutes as worthy of special protection because of its natural attributes.

Environmental Consequences

The restoration project would have little to no adverse impact on hydrology and water quality since all work would be confined the dune area and no additional fill or excavation would be necessary to accomplish the goal of the restoration. All appropriate permits would be obtained prior to begin of construction and all BMPs and conditions set forth will be followed. After restoration is complete, no long-term impacts are anticipated as the project will take place within the exiting footprint of the original dunes. Impacts to hydrology and water quality would be short-term and would have little to no adverse impact. The proposed project is not anticipated to require authorization by the U.S. Army Corps of Enginners (USACE) pursuant to the Clean Water Act Section 404 and/or Rivers and Harbors Act (CWA/RHA).

12.27.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

Air quality and greenhouse gas (GHG) emissions at the site are primarily affected by the nearby Perdido Key Drive, parking areas adjacent to the dunes, nearby residential development in the area, and boat traffic in the Gulf of Mexico and Old River. Air quality within the Florida panhandle is in attainment with the National Ambient Air Quality Standards (EPA 2013). To determine if an area meets the ozone standard in 2012, data from 2009, 2010 and 2011 is needed to determine an area's attainment status with the 8-hr ozone standard. If the average is higher than 75 parts per billion, the area would not meet the ozone standard. In Escambia County, Florida, the 2012 year-to-date 3 year average is 73 parts per billion, thus meeting attainment status (DEP 2013).

Vehicle emissions directly associated with construction would only come from the use of ATVs to shuttle vegetation and hand tools to the dune restoration sites. A pick-up truck with a trailer, a tractor trailer for initial material delivery, and a bobcat with auger are considered limited duration equipment and will only be used on site for transitory use. No other emission sources are expected as construction will not require constant use of heavy equipment.

Environmental Consequences

Negative impacts to overall air quality would not occur because the installation of plants and sand fencing will be short in duration and will use hand tools. Construction activities would have a short-term negligible negative impact on air quality and GHG emissions at the site as the GHG emission calculation for the construction and transportation equipment (11.4 metric tons/year) fell well below the 25,000 metric ton/year of CO_2 threshold (Table 12-65). During construction activities, use of ATVs and handheld tools would not likely increase emissions at the project site. Construction will be relatively short in duration and no long-term impacts to air quality or GHG emissions would be expected to result from this project. Dune plantings will have a moderate beneficial impact to air quality.

Based on Table 12-65, no long-term impact to air quality or GHG emissions would result from this restoration project because contributions to GHGs fall below the 25,000 metric ton/year threshold.

Project implementation would not require the regular use of heavy equipment; therefore, air pollution due to equipment exhaust would not be an issue. Available BMPs would be employed to prevent, mitigate, and control potential minor air pollutants during project implementation. Any minor pollution that does occur would be localized and short in duration. No air quality related permits would be required. Adverse impacts to air quality would be minor to negligible.

Table 12-65. Estimated greenhouse gas emissions for equipment to be used.

EQUIPMENT[40]	CO2 (METRIC TONS)[41]	CH4 (CO2E) (METRIC TONS)[42]	NOX (CO2E) (METRIC TONS)	TOTAL CO2E (METRIC TONS)
Bobcat	5.32	0.0028	0.028	5.32
Tractor Trailer	0.085	0.00005	0.0005	0.085
Pickup truck	1.2	0.00075	0.0075	1.2
ATV (assume similar to pickup)	4.8	0.003	0.03	4.8
TOTAL	11.405	0.0066	0.066	11.405

12.27.5.2.4 Noise

Affected Resources

Existing ambient noise levels along the shoreline at Perdido Key are low and predominantly result from the nearby Perdido Key Drive, parking areas adjacent to the dunes, nearby residential development, military aircraft operations (Pensacola Naval Air Station), and boat traffic on the Gulf of Mexico and Old River (USFWS 2011). Residential construction is increasing on the Key where temporary noise may become an issue, especially at the developments located in or near beachfront areas during the tourist season. There are no timing/dBA level restrictions from natural resource agency recommendations for the project area.

Environmental Consequences

Human presence and use of ATVs and hand tools employed during construction would not generate a noticeable change in the level of ambient noise in the general area. However, human presence and the use of ATVs may disturb wildlife in the immediate area. As such, noise would be kept to a minimum using best management practices. The level of noise is unlikely to affect resources. Timing considerations will be made to address species needs/concerns raised in the biological review process. Adverse impacts from noise during the construction phase would be minor and short in duration. However, no long-term impacts to noise from the proposed project are expected after construction work is complete.

[40] Emissions assumptions for all equipment based on 8 hours of operation.

[41] CO_2 emissions assumptions for diesel and gasoline engines based on USEPA 2009.

[42] CH_4 and NOx emissions assumptions and CO_2e calculations based on USEPA 2011.

12.27.5.3 Biological Environment

12.27.5.3.1 Living Coastal and Marine Resources

Protected Species

Affected Resources

The Gulf Coast has a variety of shoreline types including sandy beaches, barrier islands, SAV, forested swamps, marshes, tidal mud flats, saltpans, cheniers and coastal forests, and estuarine systems. The beach and dune system of the Perdido Key area is a dynamic environment subject to extensive change as a result of wind, waves, tides and storms. Native salt-resistant vegetation is essential to the beach and dune system as it both accumulates and stabilizes sand. Vegetation traps wind-blown sand which collects around the plant and builds up the dune in a process known as "accretion." As the plants become buried, new roots develop on the recently buried stems while new stems emerge from the sand. A dense stand of sea oats, and other primary vegetation in the foredune can significantly minimize erosion during high tides and storms.

Habitat surrounding the Perdido Key dune restoration project area is characterized as natural beach and dune habitat, with some development in the immediate vicinity behind the dunes. This habitat is located along seaward, foredunes, and typically contains a mixture of open sandy areas, grasses and forbs. The vegetative community is typically dominated by plants such as sea oats, panic grass, beach morning-glory, and seashore elder. Vegetation in this project area, however, has been degraded due to storms and flooding.

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

The Trusteeshave reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS. For this, the Trusteesfirst reviewed the species list for Escambia County, Florida[43]. Table 12-66 presents a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

[43] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information downloaded March 13, 2013.

Table 12-66. Potential Impacts to Species/Critical Habitats managed by USFWS

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle, Hawksbill turtle, Kemp's ridley turtle; Leatherback turtle, Loggerhead turtle	The main risk to sea turtles during implementation of this project would come should work be conducted during the turtle nesting and hatching season from approximately May through October when turtles, and to a greater extent their nests and hatchlings could be harmed or killed as a result of materials being conveyed along the beach and running over nests or hatchlings. Due to the conservation measures, the Trusteesexpect impacts to all life stages of sea turtles to be minimized such that disturbance and potential for harm are minimized such that the impacts are insignificant and discountable. Furthermore, it is planned that all boardwalk work (i.e., majority of any heavy equipment use) would occur prior to turtle nesting season, and prior to heavy human use (generally during the late fall, winter, and early spring). No lighting will be installed. No designated critical habitat for the green, leatherback, or hawksbill sea turtles occurs within the action area. No critical habitat has been designated for the Kemp's ridley sea turtle; therefore, none will be adversely affected or modified.
Loggerhead proposed critical habitat	The project area overlaps with the currently proposed critical habitat area LOGG-N-33 encompassing nearshore reproductive habitat in Florida for Northwest Atlantic Distinct Population Segment of the loggerhead sea turtle as these habitats are terrestrial (i.e., beaches and shorelines) ((78 FR 18000) Department of the Interior, 2013). Primary Constituent Elements (PCEs) for proposed loggerhead critical habitat include: 1) Suitable nesting beach habitat that: (a) has relatively unimpeded nearshore access from the ocean to the beach for nesting females and from the beach to the ocean for both post-nesting females and hatchlings and (b) is located above mean high water to avoid being inundated frequently by high tides. 2) Sand that: (a) allows for suitable nest construction, (b) is suitable for facilitating gas diffusion conducive to embryo development, and (c) is able to develop and maintain temperatures and moisture content conducive to embryo development. 3) Suitable nesting beach habitat with sufficient darkness to ensure that nesting turtles are not deterred from emerging onto the beach and hatchlings and post-nesting females orient to the sea. Temporary use of heavy equipment to construct walkovers or transport plants during restoration activities could change sand characteristics important to nest construction and embryo development in the immediate area of work. However, conservation measures should minimize impacts such that impacts to the PCE's in the immediate area are short-term (1 season or less) and wind and storm conditions should restore natural properties with each storm event prior to the next nesting season. Furthermore, the walkovers (i.e., majority of any heavy equipment use) will be constructed prior to the turtle nesting season and prior to the heavy human use period (during the late fall, winter, and early spring) thereby avoiding potential impacts during the nesting season which should allow time for the beach to recover prior to the next nesting season. Though engineering designs are not complete, it is likely that walkovers will be extended further on the beach due to migration of the dunes since the old boardwalks were constructed and to meet ADA standards. These short extensions would not impact nearshore access in the immediate area. No lighting will be installed. In addition, the relative footprint of all driving and construction will be minimized so that PCE's outside the immediate area of work are unaffected. Dune restoration may enhance beaches for nesting by helping to establish dunes which can block light from adjacent areas. Based upon the implementation of the conservation measures, no adverse modification of proposed loggerhead critical habitat is anticipated.
Perdido Key beach mouse	The main risk to the Perdido Key beach mouse is the collapse of burrows during construction which can result in abandonment of the burrow by the adults leading to potential harm or mortality and mortality of any young within the burrow, and increased risk of predation on adults. Visitor use is not expected to increase as a result of the proposed project therefore no indirect impacts from visitor use (increased predation) are expected due to the proposed project. Because of the conservation measures (including those for critical habitat), the Trusteesbelieve impacts to beach mice are insignificant and discountable.
Perdido Key beach mouse	The project area overlaps with Perdido Key Beach Mouse Critical Habitat Units 2 (West Perdido

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
critical habitat	Key Unit – 114 acres) and 3 (Perdido Key State Park Unit – 238 acres). PCE's are: 1) A contiguous mosaic of primary, secondary scrub vegetation, and dune structure, with a balanced level of competition and predation and few or no competitive or predaceous nonnative species present, that collectively provide foraging opportunities, cover, and burrow sites; 2) Primary and secondary dunes, generally dominated by sea oats that, despite occasional temporary impacts and reconfiguration from tropical storms and hurricanes, provide abundant food resources, burrow sites, and protection from predators; 3) Scrub dunes, generally dominated by scrub oaks, that provide food resources and burrow sites, and provide elevated refugia during and after intense flooding due to rainfall and/or hurricane induced storm surge; 4) Functional, unobstructed habitat connections that facilitate genetic exchange, dispersal, natural exploratory movements, and recolonization of locally extirpated areas; and 5) A natural light regime within the coastal dune ecosystem, compatible with the nocturnal activity of beach mice, necessary for normal behavior, growth and viability of all life stages. The proposed project is not expected to negatively impact PCE's but rather may benefit PCE's. The existing boardwalks and lack of dunes in the area could be limiting the amount of contiguous habitat, food resources, burrow sites, and the boardwalks may be causing obstructions due to their low height. Dune restoration may contribute to building more functionality in PCE's 1,2, 3 and 4: raising of boardwalks should allow for unobstructed movements by mice; and lengthening boardwalks will help prevent dune erosion (pathway "fanning") from general visitor use thereby reducing changes to burrow sites, food resources, and susceptibility to hurricane/storm impacts. No lighting will be installed as a part of the proposed project. Based upon the implementation of the conservation measures, no adverse modification of critical habitat is anticipated.
Piping plover	The main risk to Piping plovers is from human disturbance while resting and foraging in habitats adjacent to work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the plovers to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The Trusteesdo not expect an increase in visitor use from the proposed project; therefore, no indirect impacts are expected. Piping plover critical habitat is not designated in or near the action.
Red knot	The main risk to Red knots is from human disturbance while resting and foraging in habitats adjacent to work areas. The proposed project could result in short term increases in noise which could startle individuals, though the Trusteeswould expect normal activity to resume within minutes or cause the red knots to move to a nearby area. Because other foraging/resting habitats are nearby (less than two miles) the Trusteeswould expect this temporary displacement to be within normal movement patterns and consider this effect insignificant and discountable. The Trusteesdo not expect an increase in visitor use from the proposed project; therefore, no indirect impacts are expected.

Based on the Trustees'reviews of project materials (Spring 2013) in coordination with representatives from NOAA's Protected Resource Division (PRD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project falls outside of NMFS Endangered Species Act (ESA) jurisdiction, as it does not contain suitable habitat for species managed by NMFS. As a result, the project did not require further ESA evaluation from NOAA.

Additional information on some of the species described above is provided below.

Perdido Key Beach Mouse

The Perdido Key Beach Mouse (PKBM) is endemic to Perdido Key in Alabama and Florida (Humphrey 1992). The historic range of the PKBM included coastal dunes extending from Gulf State Park-Florida Point in Baldwin County, Alabama, to the eastern terminus of Gulf Islands National Seashore-Johnson's Beach in Escambia County. The USFWS originally identified three areas of critical habitat for the mouse, including areas within Perdido Key State Park and adjacent privately owned lands. PCE's for critical

habitat are: 1) A contiguous mosaic of primary, secondary scrub vegetation, and dune structure, with a balanced level of competition and predation and few or no competitive or predaceous nonnative species present, that collectively provide foraging opportunities, cover, and burrow sites; 2) Primary and secondary dunes, generally dominated by sea oats that, despite occasional temporary impacts and reconfiguration from tropical storms and hurricanes, provide abundant food resources, burrow sites, and protection from predators; 3) Scrub dunes, generally dominated by scrub oaks, that provide food resources and burrow sites, and provide elevated refugia during and after intense flooding due to rainfall and/or hurricane induced storm surge; 4) Functional, unobstructed habitat connections that facilitate genetic exchange, dispersal, natural exploratory movements, and recolonization of locally extirpated areas; and 5) A natural light regime within the coastal dune ecosystem, compatible with the nocturnal activity of beach mice, necessary for normal behavior, growth and viability of all life stages.

Sea Turtles

There are five species of endangered or threatened sea turtles that may occur or have the potential to occur in the project area. These include green turtle, hawksbill turtle, Kemp's ridley turtle, leatherback turtle, and loggerhead turtle. Sea turtles forage in the waters of the coastal Florida panhandle region and occur in the waters adjacent to the project area. The project site contains suitable sea turtle nesting habitat along the sandy beach.

Piping Plover

The sandy beaches and shorelines within the project area offer suitable foraging and resting habitat for the piping plover during the winter migratory season, and piping plover may forage in the shallow waters of the project area. Natural shorelines in the proposed project vicinity provide suitable winter migration resting habitat for the piping plover. Piping plover wintering habitat includes beaches, mudflats, and sandflats, as well as barrier island beaches and spoil islands (Haig 1992 as cited by USFWS 2013). On the Gulf Coast, preferred foraging areas are associated with wider beaches, mudflats, and small inlets (USFWS 2013).

Red Knot

The red knot, a federal proposed species, uses the state of Florida both for wintering habitat and migration stopover habitat for those that continue to migrate down to specific wintering locations in South America (Niles et al. 2008) and could be present in the project area. Wintering and migrating red knots forage along sandy beaches, tidal mudflats, saltmarshes, and peat banks (Harrington 2001). Observations indicate that red knots also forage on oyster reef and exposed bay bottoms, and roost on high sand flats, reefs, and other sites protected from high tides (Niles et al. 2008). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Threats to wintering and stopover habitat in Florida include shoreline development, hardening, dredging, deposition, and beach raking (Niles et al. 2008).

Migratory Birds and Bald Eagles

The snowy plover (*Charadrius alexandrinus*) is a small whitish light colored shorebird with a dark, thin bill and dark legs. Snowy plovers are solitary nesters and require open dry sand near dunes for breeding. Nesting can occur in early February but typically the nesting season is March to September in Florida. Nests are an open scrape, sometimes lined with shell matter, within sight of the Gulf of Mexico and near the frontal dune line. Snowy plover nesting has been well documented at Gulf Islands National Park and

recent nesting attempts were documented at nearby Perdido Key State Park. All nesting locations have been on State or Federal lands. Suitable nesting habitat does not usually exist in the privately owned lands in the area. However, resting and feeding habitat may occur in the area.

There are no wading bird rookeries at the site. Due to the lack of wooded areas surrounding the site, there is little potential for bald eagle nesting in the area and none are currently present in the action area. If bald eagles would be found nesting within 660 feet of the construction area, then activities would need to occur outside of nesting season, or avoidance measures would need to be followed.

The DOI review also considered potential impacts to migratory birds. A summary of the potential impacts to different migratory bird groups is presented in Table 12-67.

Table 12-67. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Shorebirds	Foraging, feeding, resting, nesting	Shorebirds nest, forage, feed, and rest in the types of habitats consistent with some of the shoreline areas near the proposed project. As such, they may be impacted locally and temporarily by the project.
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Resting, roosting, nesting	Seabirds forage in water and rest/roost in terrestrial habitats including dunes. Project activity could startle resting birds; however, impacts to roosting birds are not expected because activities will occur during the day.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in Table 12-68.

Table 12-68. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Shorebirds	The Trusteesexpect foraging and resting birds would be able to move to another nearby location to continue foraging and resting. If project activities occur during shorebird nesting season (February 15 to August 31), the FWC will be contacted to obtain the most recent guidance to protect nesting shorebirds or rookeries and their recommendations will be implemented. The Panama City Field Office will be contacted regarding dune plantings to balance habitat for listed and migratory birds and beach mouse.
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care will be taken to minimize noise and physical disruptions near areas where foraging or resting birds are encountered. All disturbances will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity, which they will have. Roosting should not be impacted because the project will occur during daylight hours only. Nesting should not be impacted because the project will not occur near nesting habitats.

Essential Fish Habitat

Based on the Trustees'reviews of project materials (Spring 2013) in coordination with representatives from NOAA's Habitat Conservation Division (HCD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that this project will not affect EFH because there is no EFH in the project area. As a result, the project did not require further EFH evaluation.

Environmental Consequences

Protected Species

Considering the nature of the potential project and the species/critical habitats that could be affected, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in Table 12-69 below.

Table 12-69. Conservation measures to be implemented in order to minimize impacts to species/critical habitats managed by DOI

SPECIES	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Green turtle, Hawksbill turtle, Kemp's ridley turtle, Leatherback turtle, Loggerhead turtle	No lighting will be installed on the boardwalks. Should work be undertaken between May 1 and October 31 the following conservation measures will be followed: Work completed outside of this time period should not require these measures. • All construction personnel will be notified of the potential presence of sea turtles and reminded of the criminal and civil penalties associated with harassing, harming, or killing sea turtles (all life stages). • The local sea turtle nesting surveyor will conduct daily sea turtle nesting surveys will assess the need for the relocation of sea turtle nests that could be affected by the project construction prior to project implementation each day • If a sea turtle (either adult or hatchling) is observed, maintain at least 200 feet between the turtle and personnel. • All actions shall observe a 10-foot buffer from marked sea turtle nests. Between May 1 and August 31[44], actions with mechanized equipment or vehicles shall not begin prior to 9:00 am to ensure sea turtle monitoring surveys are completed for the day. • If altered, beach topography shall be restored in all areas to the natural beach profile by 20:00 hours each day. Restoring beach topography includes raking of tire ruts, filling pits or holes. • Avoid driving over the wrack line or areas of dense seaweed, as these habitats may contain sea turtle hatchings or baby birds that are difficult to see.
Loggerhead proposed critical habitat	To maintain PCE's for proposed loggerhead critical habitat, the following measures shall be implemented (regardless of seasonality): • All construction personnel will be notified of the presence of proposed critical habitat and reminded to avoid impacting it otherwise additional restoration may be necessary. • The nearest, existing staging, access and egress areas, travel corridors, pathways, and roadways shall be used (including those provided by the State, local governments, land managers, trustee, or private property owner, with proper permissions). • No new staging areas, access or egress, or travel corridors shall be created. • Minimize vegetation removal.

[44] Turtle *nesting* season is May 1 to August 31, while turtle *hatching* continues until October 31. The remaining turtle BMPs will be implemented May 1 through October 31 and BMPs for proposed critical habitat will be implemented all year.

SPECIES	CONSERVATION MEASURES TO MINIMIZE IMPACTS
	• If driving equipment or vehicles on the beach, enter at designated access, proceed directly to the hard-packed sand near or below the high tide line and stay below the tide line when driving long distances. • Avoid driving on the upper beach whenever possible, and never drive over any dunes or beach vegetation. • Use the smallest footprint possible to complete the proposed project. • If altered, beach topography shall be restored in all areas to the natural beach profile by 20:00 hours each day. Restoring beach topography includes raking of tire ruts, filling pits or holes. • No lighting will be installed.

Perdido Key beach mouse	Conservation measures that will be implemented to avoid impacts to the Perdido Key Beach Mouse include:
	
	• All construction personnel will be notified of the potential presence of Perdido Key Beach Mice and reminded of the criminal and civil penalties associated with harassing, injuring, or killing Perdido Key Beach Mice.
	• To minimize impacts to Perdido Key beach mice in burrows, a qualified, permitted, biologist will survey the project site before work commences and flag potential burrows and tracks so that they can be avoided.
	• Construction noise will be kept to the minimum feasible.
	• Construction will occur during the day to minimize disturbance to nocturnal patterns.
	• Equipment, vehicles, and project debris will not be stored in a manner or location where it could be colonized by mice.
	  ○ Prior to bringing any equipment (including personal gear, machinery, vehicles or vessels) to the work site, inspect each item for mud or soil, seeds, and vegetation. If present, the equipment, vehicles, or personal gear shall be cleaned until they are free from mud, soil, seeds, and vegetation. This inspection will occur each time equipment, vehicles, and personal gear are being prepared to go to a site or prior to transferring between sites to avoid spreading exotic, nuisance species.
	  ○ Inspect sites periodically to identify and control new colonies/individuals of an invasive species not previously observed prior to construction.
	  ○ Remove trash or anything that would attract nuisance wildlife to work areas daily.
	• Project related trash or debris shall not be allowed to blow into open water, onto beaches or in the dunes.
	• Appropriate waste/trash receptacles will be installed and maintained at boardwalks so that predators are not attracted to the area.

Perdido Key beach mouse critical habitat	Conservation measures that will be implemented to avoid impacts to the Perdido Key Beach Mouse critical habitat include: • The project will occur in very localized locations for very short periods of time, allowing the mosaic of primary, secondary scrub vegetation and dune structure to remain unchanged or increase after implementation. • If native dune plants are destroyed during the project, appropriate native plants will be planted in the same location to minimize impacts to the vegetative composition of the area. The Panama City Field Office will be contacted regarding dune plantings to balance habitat for listed and migratory birds and beach mouse. • If necessary (due to food source removal during construction and growing periods for replacement plants), supplemental beach mouse food sources will be provided. • Project work will only occur during daylight hours. As such it will not alter the natural light regime of the area.

SPECIES	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Piping plover and red knot	If construction occurs within the period from August to May: shorebird surveys will be conducted in the project area; and within the project area a 300-foot wide buffer zone where either species congregates will be established. Any and all construction will be prohibited in the buffer zone until the individuals move from the area of their own volition. The Panama City Field Office will be contacted regarding dune plantings to balance habitat for listed and migratory birds and beach mouse.
All	In addition to the species specific measures that have been identified, the new dune walkovers associated with the Perdido Key State Park Beach Boardwalk Improvements action will be constructed in a manner consistent with the recent guidance for such work issued by the USFWS Panama City field office (USFWS, 2013). In addition: · Dune restoration should mimic natural dunes including swales with and without vegetation. · ATVs should stay out of the dunes and as low to the water line as possible. Plants may have to be walked up to the planting area from the ATV travel path. · Construction of the dune walkovers should be consistent with existing guidelines. · Prior to conducting the restoration, contact PCFO about the dune plantings (especially to avoid least tern nesting areas – this measure is within the mig bird section, but the Trusteesdid not specifically mention least tern. Least terns will not nest in veg, so the Trusteesshould not plant their nesting area.) . Further, the following items were noted: · It may be necessary to use a fertilizer to jump start plant growth. · If sand fencing is used, it should be moved up regularly as the dune grows and removed as soon as the dune and plants are large enough to capture sand. · Use some larger plants mixed with the typically used smaller plants to help capture sand immediately. · Post and rope should be used and maintained around the entire restoration area to keep people from affecting the restoration.

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On April 4, 2014 the review of potential impacts to species managed by USFWS was completed (McClain, 2014). The USFWS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect, five species of sea turtles in terrestrial habitats (green, hawksbill, Kemp's ridley, leatherback, and loggerhead), Perdido Key beach mouse, piping plover, and red knot (if listed)based upon the successful implementation of the conservation measures in Table 12-69 above . The USFWS also concurred with the Trustees'determination that the project will not adversely modify or destroy critical habitat for the Perdido Key beach mouse or destroy critical terrestrial habitat for the loggerhead sea turtle (if designated).

Migratory Birds and Bald Eagle

Bald eagles are not present at the project location so will not be affected. At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

Invasive Species

Affected Resources

Non-native invasive species could alter the existing terrestrial or aquatic ecosystem within, and possible expand out into adjacent areas after the initial introduction. The invasive species threat, once realized, could result in economic damages. Prevention is ecologically responsible and economically sound. Chapter 3 described more about the regulations addressing invasive species, pathways, impacts, and prevention. At this time specific invasive species that may be present on the project site or could be introduced through the project have not yet been identified.

Environmental Consequences

Best Management Practices (BMPs) to control the spread of any invasive species present, and prevent the introduction of new invasive species due to the project will be implemented. In general, best management practices would primarily address risk associated with vectors (e.g., construction equipment, personal protective equipment, delivery services, foot traffic, vehicles/ vessels, shipping material). There are many resources that provide procedures for disinfection, pest-free storage, monitoring methods, evaluation techniques, and general guidelines for integrated pest management that can be prescribed based upon specific site conditions and vectors anticipated. In addition, to best management practices, outreach and educational materials may be provided to project workers and potential users/visitors. Other measures that could be implemented are identified in the Chapter 6 Appendix. Due to the implementation of BMPs, the Trusteesexpect impacts due to invasive species introduction and spread to be short term and minor.

12.27.5.4 Human Uses and Socioeconomics

12.27.5.4.1 Socioeconomics and Environmental Justice

Affected Resources

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

The Perdido Key dune restoration project is located within Escambia County which encompasses 661 square miles, or 420,480 acres, with an additional 64,000 acres of water area. The population of Escambia County is currently estimated at 302,715. Data and characteristics on the population of Escambia County are summarized and compared to those same measures for the population of the state as a whole (Table 12-70).

Environmental Consequences

The proposed project would create jobs in the short-term during construction and planting. The improved beach access and dune restoration would result in a minor increase in visitation to the site, which could benefit the local economy for multiple years. This project would not create a benefit for any specific group or individual, but rather would produce benefits realized by the local community and visitors. There are no indications that the dune improvements would be contrary to the goals of E.O. 12898, or would create disproportionate, adverse human health or environmental impacts on minority or low income populations of the surrounding community. Therefore no environmental justice issues would be anticipated in the short-term or long-term.

The proposed project would be expected to have short-term, beneficial impacts on socioeconomics for project area and adjacent areas, based on a very slight increase in the workforce, required to perform the restoration. The exact number of person to be employed by this project is undetermined, but is estimated to be approximately eight persons.

Table 12-70. Population characteristics of Escambia County compared with State of Florida data.

U.S. CENSUS DATA QUICKFACTS BY COUNTY	ESCAMBIA	FLORIDA
Population, 2012 estimate	302,715	19,317,568
Persons under 5 years, percent, 2012	6.2%	5.5%
Persons under 18 years, percent, 2012	21.1%	20.7%
Persons 65 years and over, percent, 2012	15.2%	18.2%
Female persons, percent, 2012	50.5%	51.1%
White alone, percent, 2012 (a)	70.1%	78.3%
Black or African American alone, percent, 2012 (a)	22.9%	16.6%
American Indian and Alaska Native alone, percent, 2012 (a)	0.9%	0.5%
Asian alone, percent, 2012 (a)	2.9%	2.7%
Native Hawaiian and Other Pacific Islander alone, percent, 2012 (a)	0.2%	0.1%
Two or More Races, percent, 2012	3.0%	1.9%
Hispanic or Latino, percent, 2012 (b)	5.1%	23.2%
White alone, not Hispanic or Latino, percent, 2012	66.0%	57.0%
Homeownership rate, 2007-2011	67.3%	69.0%
Median household income, 2007-2011	$43,707	$47,827
Persons below poverty level, percent, 2007-2011	16.9%	14.7%
Manufacturer shipments, 2007 ($1000)	2,117,030	104,832,907
Merchant wholesaler sales, 2007 ($1000)	1,838,916	221,641,518

(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, so also are included in applicable race categories.
Source: US Census Bureau State & County QuickFacts 2012

12.27.5.4.2 Cultural Resources

Affected Resources

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Environmental Consequences

Restoration of the dunes at Perdido Key is not anticipated to have any impact on cultural resources because none are known to be present and the work would take place within the existing footprint of the site. Nonetheless, a complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

12.27.5.4.3 Infrastructure

Affected Resources

There is no major infrastructure at the site; however, there are condos and residences adjacent to the project outside of the state park. The dunes are near Perdido Key Drive but are located in Perdido Key State Park, away from developed areas.

Environmental Consequences

Restoration of the dunes at Perdido Key would have no impact on infrastructure; the project includes dune restoration within the existing footprint so no major infrastructure changes would be made.

12.27.5.4.4 Land and Marine Management

Affected Resources

The project area includes part of the Perdido Key State Park and is adjacent to developed area. Surrounding land uses include un-improved areas of the park and some small residential areas. The majority of development is located on the eastern part of the Key between the bridge and River Road and the west end of Perdido Key Drive near the Alabama border. Approximately 16 percent of the land may be developed in resort/tourism related uses and in small scale commercial uses. Site-specific densities are pursuant to the requirements of the zoning districts where a site is located. Each zoning district has its own height and building footprint limitations, which vary from one zoning district to the next. Density units may not be transferred to parcels south of SR 292 (Perdido Key Drive) (USFWS 2011).

Environmental Consequences

Restoration of the dunes at Perdido Key is not anticipated to have an impact on land and marine management because changes at the site would be limited to dune resources.

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The

Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS (Federal Trustees 2013). The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process (Milligan 2014).

12.27.5.4.5 Aesthetics and Visual Resources

Affected Resources

The existing aesthetic and visual resources at the site include natural dune, beach, and Gulf of Mexico habitat. Residential housing and development is limited to the areas immediately adjacent to Perdido Key Drive. There is minimal development, other than a few parking lots, to obstruct the viewshed of the dune restoration project area.

Environmental Consequences

Impacts to visual resources would be limited to the restoration time frame. Beneficial impacts on aesthetics and visual resources would be expected following the restoration as a result of enhanced quality of dune habitat and viewshed. The improved habitat would enhance the look of the natural dune habitat.

Aesthetics would be reduced in the project area during construction due to the presence of equipment and materials. However, these impacts would be minor, temporary changes to visual resources. Following construction and planting the project would provide moderate long-term beneficial aesthetic impacts to the dune habitat and visitor access areas.

12.27.5.4.6 Tourism and Recreational Use

The project site is currently a tourist and recreational user destination. Some dune walkovers provide users with access to the beach and provide opportunities for observing natural dune and beach habitat and wildlife. Leisure and recreational pursuits are on the increase on Perdido Key, along with northwest Florida. The impact of recreation and tourism on the economy continues to expand. Recreational visits to state and national parks grew by an estimated 300,000 visitors from 2003 to 2004 and taxable sales of transient facilities outpaced Florida's growth rate (7.7 % v. 6.3%). Employment and payroll for the tourism industry was also up (0.8 % and 2.4%, respectively) (USFWS 2011).

Recreation opportunities on Perdido Key revolve around the mild climate and water related activities typical of the Gulf coast. Recreational swimming and sun bathing provide seasonal enjoyment for residents and tourists, and fishing, both on Old River and the Gulf provide year round opportunities. Approximately half of Perdido Key is public land that provides significant recreational opportunities.

Environmental Consequences

For a short time, the construction process would limit recreational activities near the restoration areas. Access to the restored areas would be restricted during vegetation establishment. However, once the restoration project is implemented, an increase in visitation for the life of the project is anticipated. Moderate beneficial impacts to tourism and recreational use would be expected through enhanced habitat and visual quality of the restored dune habitat. There would be no long-term adverse impacts to tourism or recreational use. The project would have a moderate positive impact on recreational user

enjoyment of the site. The project would improve conservation of dune habitat and improve the overall habitat quality and function of the site.

12.27.5.4.7 Public Health and Safety and Shoreline Protection

Affected Resources

Public health and safety and shoreline protection at the site are of high quality. Part of the site includes the Perdido Key State Park and is managed to maximize health and safety for human use and the environment. There are no known hazardous waste generation or disposal sites in the vicinity of the project. Erosion at the proposed project site is typical of a barrier island shoreline.

Environmental Consequences

Restoration of the dunes at Perdido Key would have a major beneficial impact on public health and safety. The project would have no impact on existing shoreline protection, no work is planned for the shoreline and current management practices will not be altered by the project.

Planting native dune vegetation would support the natural control of shoreline erosion. Overall, the project would have a moderate beneficial impact on public health and safety and shoreline protection, and would have no negative impacts on these resources.

12.27.6 Summary and Next Steps

The proposed Florida Perdido Key Dune Restoration project would restore appropriate dune vegetation to approximately 20 acres of degraded beach dune habitat in Perdido Key, Florida, including habitat used by the federally endangered Perdido Key Beach Mouse. The project would consist of planting appropriate dune vegetation (e.g., sea oats, panic grasses, cord grasses, sea purslane, beach elder) approximately 20 – 60' seaward of the existing primary dune to provide a buffer to the primary dune and enhance dune habitats. In addition, gaps in existing dunes within the project area will be re-vegetated to provide a continuous dune structure. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would provide long-term benefits by restoring and enhancing approximately 20 acres of degraded dune habitat. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

12.27.7 References

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U.S. Fish and Wildlife Service (USFWS)

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12.28 Florida Oyster Cultch Placement Project: Project Description

12.28.1 Project Summary

The proposed Florida Oyster Cultch project would enhance and improve the oyster populations in Pensacola Bay, Andrew Bay and Apalachicola Bay. The proposed improvements include the placement of a total of 42,000 cubic yards of suitable cultch material over 210 acres of previously constructed oyster bars for the settling of native oyster larvae and oyster colonization in three Florida Bays. The total estimated cost for this project is $5,370,596.

12.28.2 Background and Project Description

The Trustees propose to enhance and improve the oyster populations in three Florida Bays (see Figure 12-55 for envisioned project locations). The objective of the proposed Florida Oyster Cultch project is promote reef development for oysters by restoring existing oyster reef habitat. The restoration work proposed includes the placement of suitable cultch material on existing or previously constructed oyster bars for the settling of native oyster larvae and oyster colonization.

Based on preliminary evaluation of the conditions of existing oyster bars, it is anticipated that restoration work will include:

- Placing approximately 12,000 cubic yards of cultch on debilitated oyster reefs over an approximately 60-acre area in the Pensacola Bay system in Escambia and Santa Rosa Counties;
- Placing approximately 12,000 cubic yards of cultch on debilitated oyster reefs over an approximately 60-acre area in the St. Andrew Bay system in Bay County; and
- Placing approximately 18,000 cubic yards of cultch on debilitated oyster reefs over an approximately 90-acre area in the Apalachicola Bay system in Franklin County.

The final size and locations for cultch placement will be based on environmental conditions within each bay system prior to deployment. Project designs, locations, and the timing of cultch deployment will be selected to maximize successful oyster spat settlement and survival. Environmental conditions such as salinity levels and productivity or recruitment rates at adjacent oyster bars will be considered in the selection of restoration sites within each bay. Therefore, the amount of cultch and the number of acres restored within each bay system may vary from the estimate above to reach the overall project goal of restoring over 210 acres of existing or previously constructed oyster bars.

Cultch material to be placed will consist of combinations of oyster shells, either mined from existing sources or from active oyster shell collection sources, and/or limestone approved for use in these projects by Florida's Department of Agriculture and Consumer Services (DACS). The cultch placement generally involves offloading material from barges mechanically using either spray cannons or large excavator type equipment. The new cultch material will be placed on top of existing oyster bars created and managed by DACS because these bars are depleted of shell material or have reached the end of their productive life. Placing substrate or "cultch" in bays where natural reproduction occurs, is the most effective technique used throughout the GOM to 1) create three-dimensional reef structure, 2) stimulate spat setting, 3) sustain oyster fisheries, 4) enhance community functions, 5) increase natural productivity and 6) accelerate the recovery process. Florida DACS has been involved in rehabilitating oyster reefs for more than sixty years and provides a multi-dimensional approach built on decades of

experience. The restoration methods proposed here are established methods for this type of restoration project.

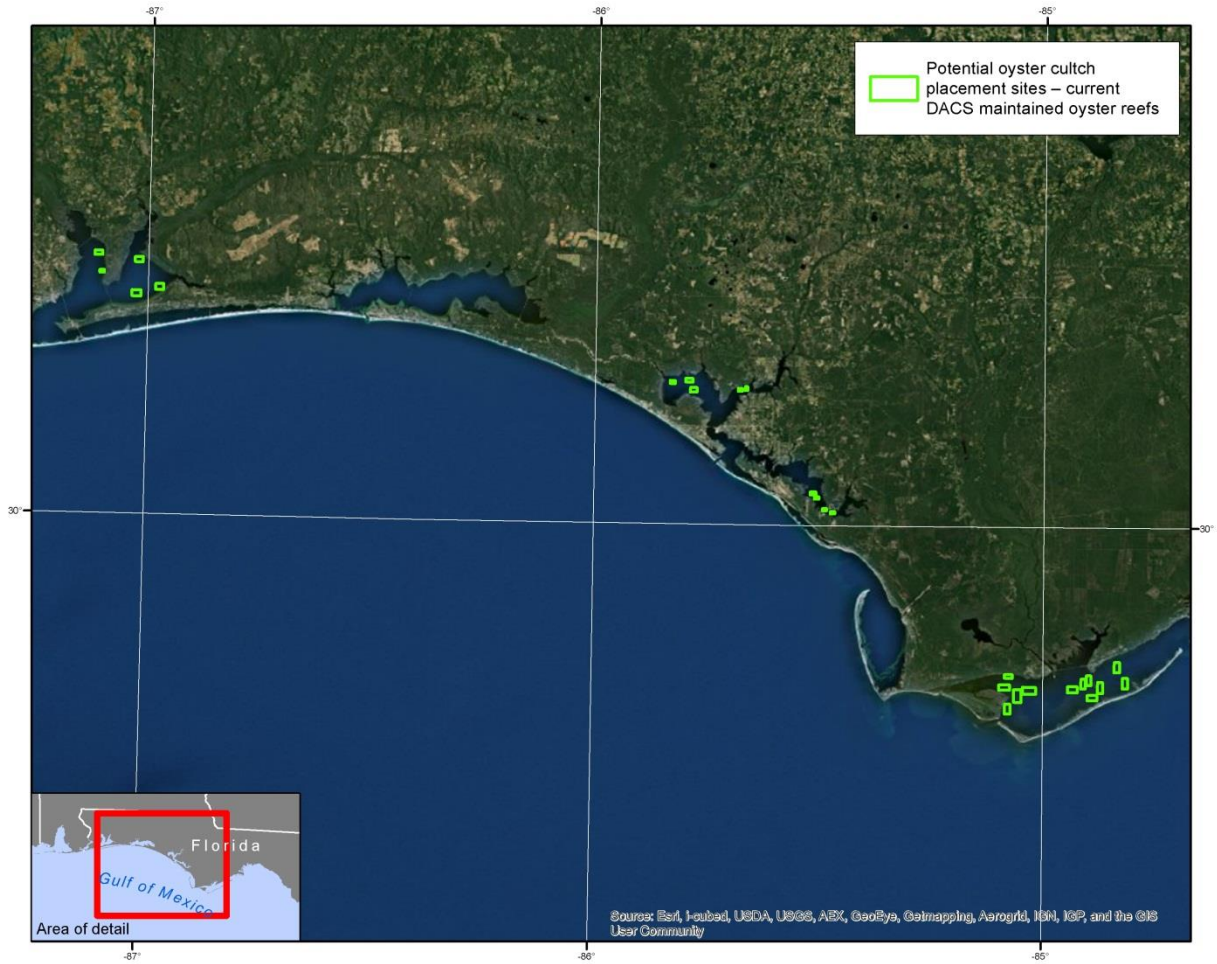

Figure 12-55. General Location of envisioned Florida Oyster Cultch Restoration Project.

12.28.3 Evaluation Criteria

This proposed project meets the evaluation criteria for the Framework Agreement and OPA. As a result of the Deepwater Horizon oil spill and associated response actions, oyster secondary productivity along the north central Gulf coast suffered adverse impacts. This project seeks to foster reef development, which would help compensate the public for Spill-related injuries and losses to oyster secondary productivity. Thus, nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Sections 6a-6c of the Framework Agreement.

The project is technically feasible and utilizes proven techniques with established methods and documented results. Florida agencies have successfully implemented similar projects in the region. These projects were designed by DACS following established methods and techniques utilized by them, other states, and private contractors to restore oyster bars. In addition, DACS has a Programmatic General Permit SAJ-99 (SAJ-2007-03138) issued to them from the US Armey Corps of Engineers to accomplish oyster restoration utilizing these techniques. For these reasons, the project has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement.

Furthermore, the cost estimates are based on similar past projects executed by DACS in the envisioned project areas and therefore the project can be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.28, indicates that adverse impacts from the project would largely be minor, localized, and often of short duration. In addition, the best management practices and measures to avoid or minimize adverse impacts described in 12.28 would be implemented. As a result, collateral injury would be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). These projects are part of DACS's Division of Aquaculture Shellfish Program and are therefore consistent with the long term restoration needs of the State. See Section 6d of the Early Restoration Framework Agreement.

Many ecological projects, including ones similar to this project, were submitted as a restoration project on the NOAA website (http://www.gulfspillrestoration.noaa.gov) and submitted to the State of Florida (http://www.deepwaterhorizonflorida.com). In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Florida Oyster Cultch Project also meets the State of Florida's additional criteria that Early Restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by response and SCAT activities for the Spill.

12.28.4 Performance Criteria, Monitoring and Maintenance

As part of the project costs, monitoring will be conducted to ensure project designs were correctly implemented and to evaluate project effectiveness. Performance criteria will be used to determine project success or the need for corrective actions. The monitoring has been designed around the project objective. The project objective is to promote reef development for oysters by restoring existing oyster reef habitat. Specific success criteria include: construction of reefs that meet project design criteria, support oyster secondary productivity, and are sustained for the expected life of the project.

Post construction performance monitoring will focus on the recruitment and growth of oysters on the new cultch placements. Restored reefs may become productive in as few as 3 to 6 months under optimal conditions, with oyster reaching market size in 12 to 18 months. However, since recruitment and survival can be highly variable, some reefs may not become productive for 2-5 years. It has been shown that restored reefs can remain productive for more than 10 years with little additional maintenance (dragging to re-expose shell material and substrate enhancement). However, if poor recruitment to restored reefs is observed, management and maintenance activities to improve spat settlement and growth will be investigated; additional management activities will be conducted as necessary and as funding allows. Based on the expected longevity of the restored reefs, a monitoring program will assess oyster population parameters for ten years.

DACS will be responsible for effectively assessing or providing guidance on the status of oyster resources on reefs that are restored during this project. Specific metrics to delineate reef locations and reef area, measure population parameters, and estimate production potential will be accomplished.

The monitoring will include collecting samples following project completion on all restored reefs and establishing a sampling schedule based on expected recruitments cycles. All restored reefs will be sampled twice a year from year-one through year-five and once a year from year-six through year-ten.

Sampling intervals may be modified to assess significant events which may affect oyster population dynamics. A total of sixteen sampling trips are planned for each restored reef.

The monitoring program will establish and describe the parameters and metrics required to accurately assess oyster reef habitat and populations on restored reefs. Reefs will be measured and delineated to determine the surface area and reef boundaries, and estimate the coverage forming available reef habitat. The Standard Oyster Resource Management Protocol utilized by the state of Florida will be used to establish baseline and serial oyster population data to measure and report changes in oyster populations and oyster population dynamics.

The Standard Oyster Resource Management Protocol is based on collecting oyster samples from quadrats established at specific sampling locations on restored reefs. Samples are collected by divers using current standard procedures and returned to the laboratory for analyses. Live oysters collected during replicated samples are individually measured, dead oysters and recent boxes are counted, predators are identified and counted, and the general condition of the reef is recorded. The numbers and size of live oysters are converted to size frequency distributions that are used to develop population parameters, such as density, production levels, recruitment, growth, and survival, which in turn, can be applied to predict population trends and identify adverse impacts from events such a hurricanes, floods and drought.

The Standard Oyster Resource Management Protocol provides that estimated production exceeding 400 bags of oysters per acre indicates healthy oyster reefs capable of sustaining commercial harvesting. Accordingly, oyster populations are 1) capable of supporting limited commercial harvesting when stocks exceed 200 bags/acre, 2) below levels necessary to support commercial harvesting when stocks fall below 200 bags/acre, and 3) considered depleted when marketable stocks are below 100 bags/acre (Berrigan, 1990). Generally, the protocol has been an accurate indicator of oyster production in Florida.

12.28.5 Offsets

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Resource Equivalency Analysis to estimate appropriate Offsets for the Florida Oyster Cultch Project. Oyster Secondary Productivity Offsets (expressed in ash-free-dry-weight DKg-Ys) were estimated for expected increases in oyster biomass (tissue) attributable to the project. In estimating DKg-Ys, the Trustees considered a number of factors, including, but not necessarily limited to, typical productivity in the project area, estimated project lifespan and project size. The Trustees and BP agreed that if this restoration is selected for implementation, BP would receive Offsets of 425,000 DKg-Ys of oyster Secondary Productivity in Florida, applicable to oyster Secondary Productivity injuries in Florida, as determined by the Trustees' total assessment of injury for the Spill. If the Offsets exceed the oyster Secondary Productivity injury in Florida, the Trustees and BP will apply "excess" Offsets to injuries to benthic Secondary Productivity (defined to include the net production of mobile and sessile invertebrate infauna and epifauna associated with hard bottom substrate) in Florida. These Offset types and amounts are reasonable for this project.

12.28.6 Cost

The total estimated cost to implement this project is $5,370,596. This cost reflects current cost estimates developed from the most current information available to the Trustees at the time of the project negotiation. The cost includes provisions for planning, engineering and design, construction, monitoring, and potential contingencies.

12.29 Florida Oyster Cultch Placement Project: Environmental Review

The proposed project involves oyster reef restoration for oyster beds that have reached their productive lifespan. The proposed project goals would be to improve and restore existing oyster beds managed by the Florida Department of Agriculture and Consumer Services (DACS). All of the areas are publicly owned and managed by DACS.

The project proponent is relying on existing Programmatic Section Rivers and Harbors Act Section 10 and Clean Water Act Section 404 Programmatic General Permit for Live Rock and Marine Bivalve Placement SAJ-99 (SAJ-2007-03138) issued to DACS. The Programmatic General Permit is intended for DACS activities. The Florida Department of Environmental Protection (FDEP) is relying on the Programmatic General Permit for Rivers and Harbors Act Section 10 and Clean Water Act Section 404coverage of the proposed project.

12.29.1 Introduction and Background

In April 2011, the Natural Resource Trustees (Trustees) and BP Exploration and Production, Inc. (BP), entered into the Framework Agreement for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill (Framework Agreement). Under the Framework Agreement, BP agreed to make $1 billion available for Early Restoration project implementation. The Trustees' key objective in pursuing Early Restoration is to achieve tangible recovery of natural resources and natural resource services for the public's benefit while the longer-term injury and damage assessment is underway. The Framework Agreement is intended to expedite the start of restoration in the Gulf of Mexico, in advance of the completion of the injury assessment process. Early restoration is not intended to, and does not, fully address all injuries caused by the Spill. Restoration beyond Early Restoration projects would be required to fully compensate the public for natural resource losses from the Spill.

Pursuant to the process articulated in the Framework Agreement, the Trustees released, after public review of a draft, a Phase I Early Restoration Plan (ERP) in April 2012. In December 2012, after public review of a draft, the Trustees released a Phase II ERP. On May 6, 2013, the National Oceanic and Atmospheric Administration (NOAA) issued a public notice in the *Federal Register* on behalf of the Trustees, announcing the development of additional future Early Restoration projects for a Phase III Early Restoration Plan (ERP). This project, in various locations spanning Pensacola Bay in Escambia and Santa Rosa Counties, St. Andrews Bay in Bay County, and Apalachicola Bay in Franklin County, was submitted as an Early Restoration project on the NOAA website and submitted to the state of Florida. In addition to meeting the evaluation criteria of the Framework Agreement and the Oil Pollution Act (OPA), the project meets Florida criteria that Early Restoration projects occur in the eight-county panhandle area that was impacted by the Spill.

This oyster reef restoration project is designed to help support natural oyster populations without requiring construction of new facilities or developing new approaches to pursuing the project objectives. The proposed project involves placing suitable cultch material, typically oyster shell but sometimes limestone or other rock/hard materials, depending on availability, on previously constructed oyster bars to allow settling of native oyster larvae and encourage oyster colonization in three Florida bays (see Figure 12-56 through Figure 12-58 for the proposed locations in each bay). Oyster shells would be added in areas where they are part of the natural marine ecosystem.

The overall likelihood of success is good, in the short and long term. There is a risk of sedimentation of the oyster cultch, which would prevent successful attachment of spat and cause the destruction of reefs during extreme weather events (e.g., hurricanes). However, the state of Florida has extensive experience restoring and creating oyster reefs in estuaries for over 50 years, and thus, these projects are anticipated to have a high likelihood of success.

12.29.2 Project Location

The proposed project is located in the state of Florida and would be completed at multiple offshore and nearshore locations in Escambia, Santa Rosa, Bay, and Franklin Counties. Appropriate project locations in Pensacola Bay, St. Andrews Bay, and Apalachicola Bay have been selected. Figure 12-53 through Figure 12-55 illustrates the proposed project locations within each of these bays respectively. The total area from all proposed project locations is approximately 210 acres.

12.29.3 Construction and Installation

This proposed project would place a total of 42,000 cubic yards of suitable cultch material over 210 acres of existing or previously constructed, commercially harvested oyster bars for the settling of native oyster larvae and oyster colonization in three Florida Bays (Pensacola Bay, St. Andrews Bay, and Apalachicola Bay).

Based on preliminary evaluation of the conditions of existing oyster bars, it is anticipated that restoration work will include:

- Placing approximately 12,000 cubic yards of cultch on debilitated oyster reefs over an approximately 60-acre area in the Pensacola Bay system in Escambia and Santa Rosa Counties;
- Placing approximately 12,000 cubic yards of cultch on debilitated oyster reefs over an approximately 60-acre area in the St. Andrew Bay system in Bay County; and
- Placing approximately 18,000 cubic yards of cultch on debilitated oyster reefs over an approximately 90-acre area in the Apalachicola Bay system in Franklin County.

The final size and locations for cultch placement will be based on environmental conditions within each bay system prior to deployment. Project designs, locations, and the timing of cultch deployment will be selected to maximize successful oyster spat settlement and survival. Environmental conditions such as salinity levels and productivity or recruitment rates at adjacent oyster bars will be considered in the selection of restoration sites within each bay. Therefore, the amount of cultch and the number of acres restored within each bay system may vary from the estimate above to reach the overall project goal of restoring over 210 acres of existing or previously constructed oyster bars.

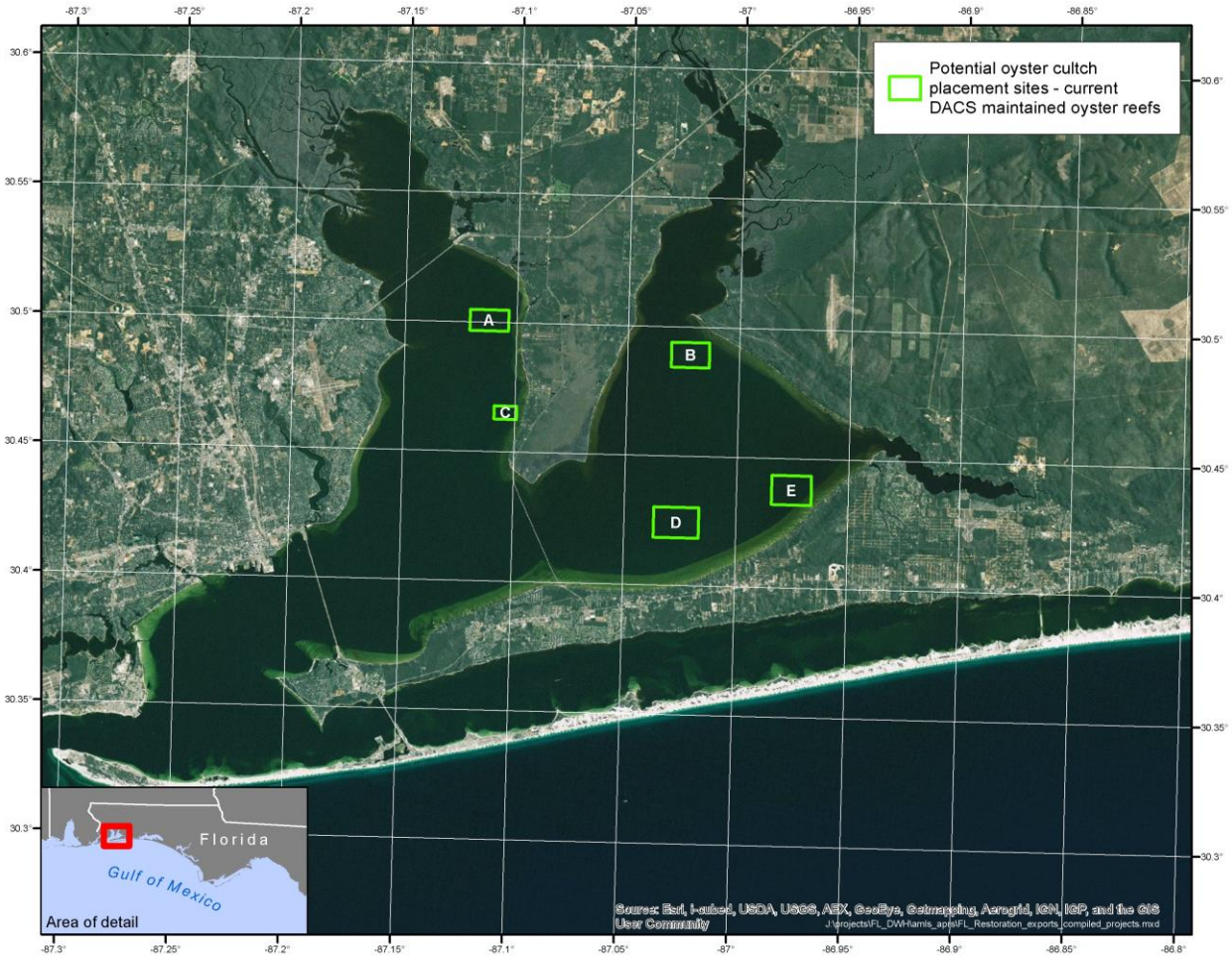

Figure 12-56. Potential Oyster reef restoration locations in Pensacola Bay.

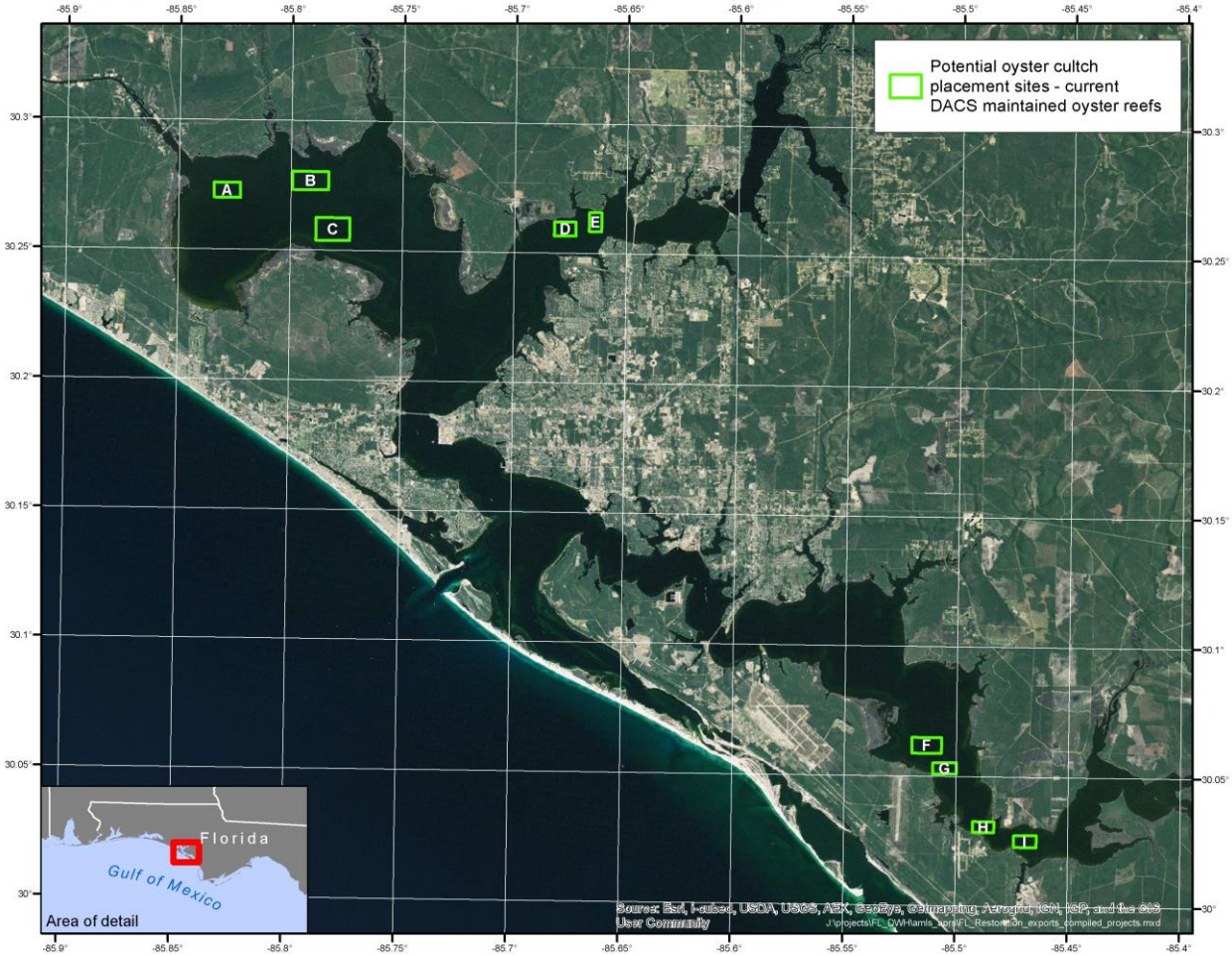

Figure 12-57. Potential oyster reef restoration locations in St. Andrew Bay.

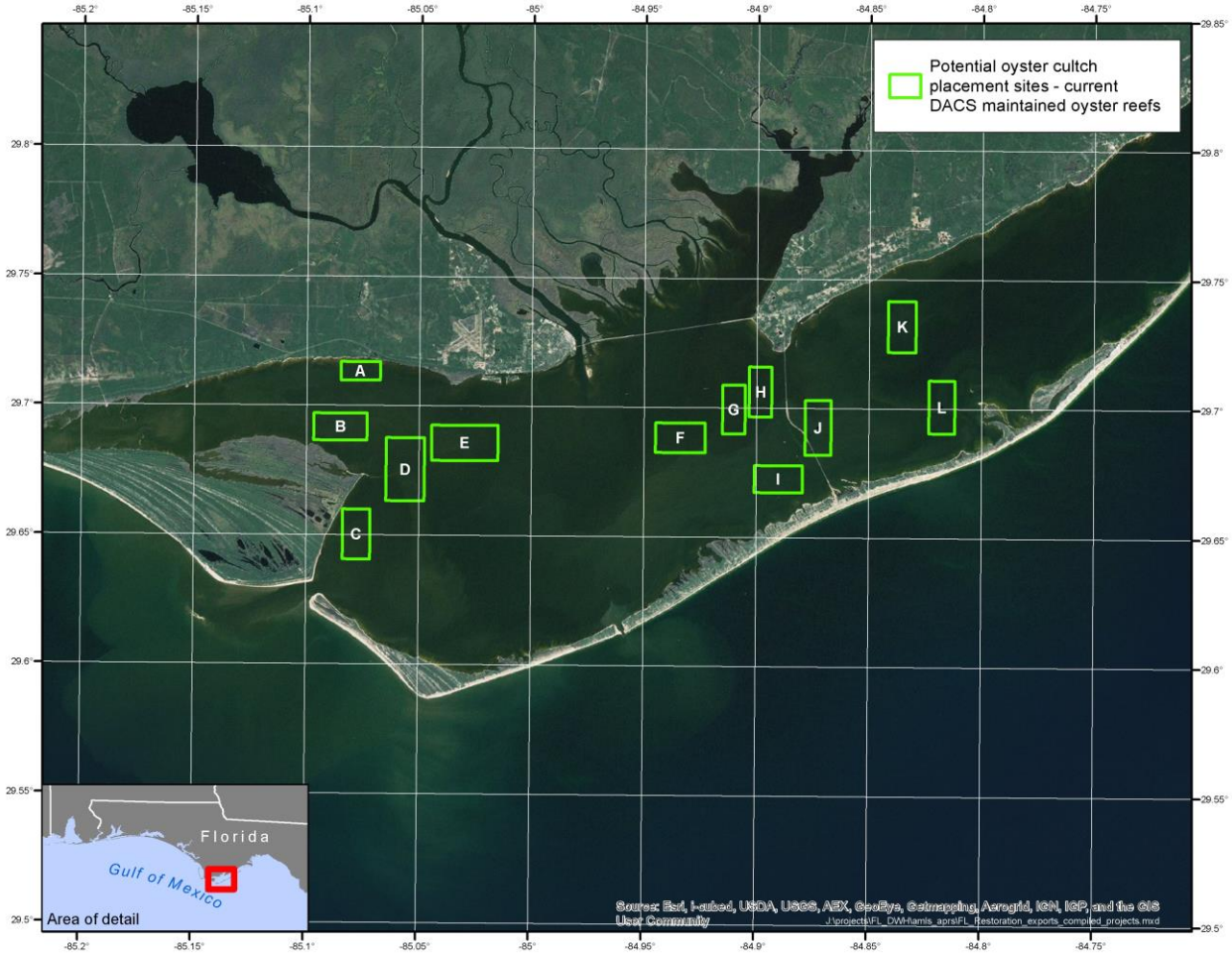

Figure 12-58. Potential oyster reef restoration locations in Apalachicola Bay.

Cultch material to be placed will consist of combinations of oyster shells, either mined from existing sources or from active oyster shell collection sources, and/or limestone approved for use in these projects by Florida's Department of Agriculture and Consumer Services (DACS). The cultch placement generally involves offloading material from barges mechanically using either spray cannons or large excavator type equipment. The new cultch material will be placed on top of existing oyster bars created and managed by DACS because these bars are depleted of shell material or have reached the end of their productive life. Placing substrate or "cultch" in bays where natural reproduction occurs is the most effective technique used throughout the Gulf of Mexico to 1) create three-dimensional reef structure, 2) stimulate spat setting, 3) sustain oyster fisheries, 4) enhance community functions, 5) increase natural productivity and 6) accelerate the recovery process. Florida DACS has been involved in rehabilitating oyster reefs for more than sixty years and provides a multi-dimensional approach built on decades of experience. The restoration methods proposed here are established methods for this type of restoration project.

Cultch material to be placed would consist of combinations of oyster shells, either mined from existing, permitted sources or from active oyster shell collection sources, and/or limestone approved for use in these project areas by DACS. Fossil shell and lime rock are commonly mined from quarries in the Gulf

Coast region and may be used if oyster shell is not available. Processed oyster shell is preferred for cultch material to restore oyster reefs where the shell is available and can be efficiently transported to reef sites.

The Department operates a work crew, with dump trucks and front-end loader tractors, to meet scheduling needs. Processed shell is collected from 2-5 days per week, depending upon the availability of shell and the time of year. Processed oyster shell is collected and transported to the stockpile areas where it is stored. The storage period provides for a process called "seasoning" which lasts for at least two weeks that removes bacterial film from the shell and provides a cleaner substrate for larval attachment. The Department maintains a shell stockpile in Apalachicola.

Seasoned shell is removed from the stockpile, placed on deck barges, and transported to reefs sites, where it is washed overboard using high pressure water jets which are never pointed directly into the seafloor (See Figure 12-59 for images of this sequence of events). Similarly, fossil shell or lime rock is transported by deck barge to the reef sites, where it is washed overboard using a high pressure water stream, or deposited using a crane and bucket. The method for deposition is determined by the material used and the configuration and elevation of the reef to be restored. Fossil shell and lime rock are products commonly mined from quarries in the Gulf Coast region. Depending upon availability, this cultch material can also be utilized. Resource managers consider this calcium carbonate-based material to be a suitable alternative cultch material for constructing oyster reef habitat. This material is also used to construct oyster reefs in areas where processed oyster shell is not readily available.

Reef locations and specific deposition sites are delineated and marked by staff prior to depositing cultch materials. The Department currently operates most of the equipment required to collect, transport and deposit the cultch material, including dump trucks, tractors, tug boat, and deck barges. Transport of the cultch to the oyster reefs for this project will occur in designated shipping channels and known deep water areas. The equipment (e.g., shallow draft barges) selected for the delivery of the cultch is made in these project to avoid potential prop dredging or scraping of bottom areas in order to avoid adversely impacting important habitats such as submerged aquatic vegetation beds. In shallower locations where such concerns exist different placement methods, such as the use of oyster boats to relay the cultch material, are incorporated to prevent impacts to these sensitive habitats. Once onsite at the reef, cultch is deposited at a rate of 100 - 300 cubic yards per acre; the amount of material deposited is determined by the condition of the reef to be restored. In cases where the physical integrity of the reef has been severely damaged, up to 300 cubic yards may be required.

For Apalachicola Bay cultch deposition, loading would occur on one day and, based on the proximity to the in-water staging area, planting would be accomplished on the following day. For all estuaries west of Apalachicola Bay, loading would be accomplished in 2 or 3 days, and travel time to and from a given estuary (2 to 9 days) would yield a maximum project duration of 12 days to accomplish the restoration work at each individual site within an estuary.

Potential impacts from boat activity associated with the placement of cultch material may be avoided with compliance during all in-water activities with the *Sea turtle and Smalltooth Sawfish Construction Guidelines* (NOAA, 2006) and *Standard Manatee Conditions for In-water Work* (USFWS, 2011).

Oyster reef restoration activities are expected to be completed within 1 year after work begins.

12.29.4 Operations and Maintenance

Project work is expected to commence 7 to 12 months after funding is received.

Cultching activities have been historically conducted from February to November. Ideally, cultching activities are conducted prior to a spat fall event; however, cultching activities are similar to crop rotation in that many oyster reef complexes require routine maintenance in the form of cultching. DACS rotates which reefs receive the required attention based on commercial harvesting seasons, availability of material, and severity of reef conditions. Post construction performance monitoring would focus on the recruitment and growth of oysters on the new cultch placements. Restored reefs may become productive in as few as 3 to 6 months under optimal conditions, with oysters reaching market size in 12 to 18 months. However, since recruitment and survival can be highly variable, some reefs may not become productive for 2 to 5 years. It has been shown that restored reefs can remain productive for more than 10 years with little additional maintenance. However, if poor recruitment to restored reefs is observed, management and maintenance activities to improve spat settlement and growth will be investigated; additional management activities will be conducted as necessary and as funding allows. Based on the expected longevity of the restored reefs, a monitoring program would assess oyster population parameters for 10 years.

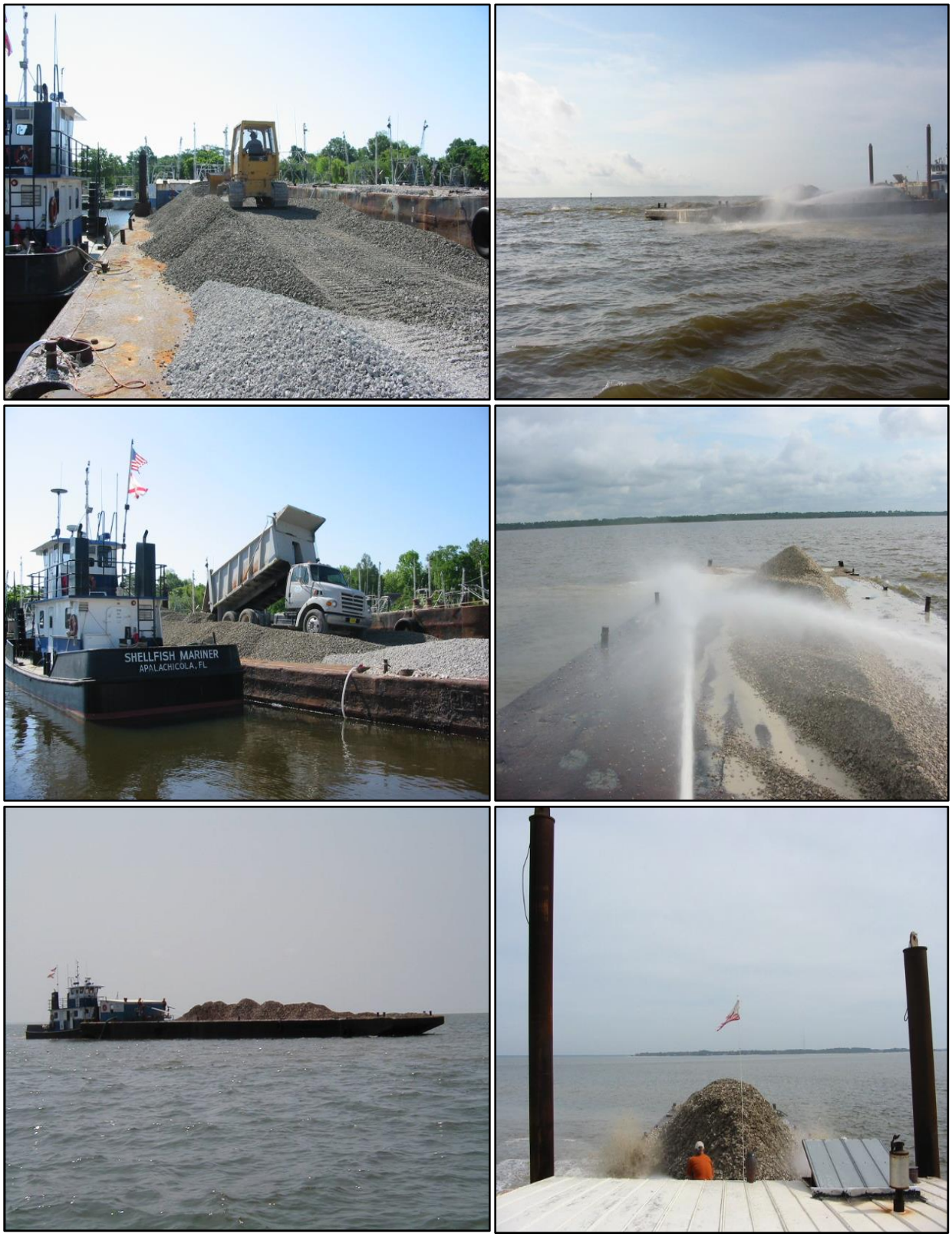

Figure 12-59. Examples of cultch loading and transportation (right images) and offloading using water cannon (left images).

Post construction performance monitoring would focus on the recruitment and growth of oysters on the new cultch placements. Restored reefs may become productive in as few as 3 to 6 months under optimal conditions, with oysters reaching market size in 12 to 18 months. However, since recruitment and survival can be highly variable, some reefs may not become productive for 2 to 5 years. It has been shown that restored reefs can remain productive for more than 10 years with little additional maintenance. Based on the expected longevity of the restored reefs, a monitoring program would assess oyster population parameters for 10 years.

DACS would be responsible for effectively assessing the status of oyster resources on reefs that are restored during this project and would collect information on a number of metrics in order to delineate reef locations and reef area, measure population parameters, and estimate production potential. The monitoring would include collecting oyster samples following project completion on all restored reefs and establishing a sampling schedule based on expected recruitments cycles. All restored reefs would be sampled twice a year from year 1 through year 5 and once a year from year 6 through year 10. Sampling intervals may be modified to assess significant events, which may affect oyster population dynamics. A total of 16 sampling trips are planned for each restored reef that would involve the use execution of the Standard Oyster Resource Management Protocol (Florida Administrative Code 2012).

12.29.5 Affected Environment and Environmental Consequences

12.29.5.1 No Action

Both OPA and NEPA require consideration of the No Action alternative. For this Final Phase III ERP/PEIS proposed project, the No Action alternative assumes that the Trustees would not pursue this project as part of Phase III Early Restoration.

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

12.29.5.2 Physical Environment

12.29.5.2.1 Geology and Substrates

Affected Resources

Geology

The existing geology and substrates in project areas for oyster reef restoration is generally flat or gently sloping. The three bays where restoration is planned are part of the Gulf of Mexico formation. Each proposed project location supports existing oyster reef structures.

In general, the estuarine embayments are within the Gulf Coast Lowlands subdivision of the Gulf Coastal Plain. The lowlands constitute a series of parallel terraces rising from the coast in successively higher levels. They formed during the Pleistocene epoch, when fluctuating sea levels were associated with the growth and melting of ice caps. Dunes, barrier islands, beach ridges, and other topographical features

were stranded inland as seas receded. Land surfaces of the lowlands are generally level and less than 100 feet above mean sea level (AMSL). Substantial areas are less than 30 feet AMSL and are characterized by excessive wetlands.

Soils

Soils in the area have been sculptured from alluvial plain underlain by sand, gravel, silt, and clay. The soil surveys for the various counties identify the areas for cultch placement as "waters of the Gulf of Mexico," and no soils data are provided (Natural Resources Conservation Service [NRCS] 2013).

Environmental Consequences

Oyster reef restoration would have no adverse impacts on geology or substrates in the proposed project locations. Oyster cultch material would be placed on existing oyster reef structures and, therefore, would not alter the geology or substrates.

12.29.5.2.2 Hydrology and Water Quality

Affected Resources

Oyster cultch restoration would take place in nearshore, open-water habitats in three Florida bays. Existing hydrology and water quality are affected by shoreline development and management, as well as boat traffic in the bays and the Gulf of Mexico.

Water Quality

The CWA requires that the surface waters of each state be classified according to designated uses. Florida has six classes with associated designated uses, which are arranged in order of degree of protection required. According to 62.302-400, Fla. Admin. Code, all of the project occurs within Class II waters (Shellfish Propagation or Harvesting). Stricter standards for water quality are required for Class II Shellfish Harvesting Waters.The surface waters of the state are designated Class III unless described in Florida rule. The Pensacola Bay watershed and Apalachicola Bay is also identified as a priority waterbody under Florida's Surface Water Improvement Management (SWIM) Program, which develops comprehensive plans for at-risk waterbodies and directs the work needed to restore damaged ecosystems, prevent pollution from stormwater runoff and other sources, and educate the public. Additional oyster populations created by the proposed project would effectively increase water quality due to their filter feeding. Short-term water quality impacts are possible due to sediment disturbance and cultch deposition.

Outstanding Florida Waters

The Apalachicola River and Apalachicola Bay are listed as OFW's (FDEP 2013c).

Aquatic Preserves

In Florida, state aquatic preserves arelisted as OFWs. Specifically, Apalachicola Bay, Fort Pickens, Yellow River Marsh, St. Joseph Bay, Alligator Harbor, and St. Andrews Aquatic Preserves are located in the general area of the proposed cultch placements. Waters in aquatic preserves and state parks, as OFWs, require additional water quality considerations; the Florida Fish and Wildlife Conservation Commission (FWC) would be consulted to determine any concerns due to proposed project activities. Short-term impacts due to cultch placement are possible but would be negligible when considering the water quality improvements made by oyster filtering.

Floodplain

The entirety of the project area is within the Florida panhandle floodplain, and waters where the work would be done are effectively the drainage holding areas for the floodplain areas to the north. The actual floodplain would not be impacted by any of the proposed activities as they would occur in open-water areas.

Wetlands

The project is located in open water, and no wetlands are known to be in the project area. Land-based storage areas for cultch material would be placed outside of wetland areas.

Environmental Consequences

Oyster cultch restoration would have no long-term adverse impact on hydrology and water quality. Restoration would be completed at existing oyster reef locations so no water bottom impacts are expected as restoration cultch would be placed on natural cultch materials. There may be short-term impacts during the approximately 1-year-long period of construction. This would include increased sediment disturbance and turbidity during cultch placement. All required permits would be obtained, and conditions, permit requirements, and best management practices (BMPs) would be followed during construction.

The restoration would have a minor, beneficial impact on water quality in the immediate vicinity of the newly placed cultch material.

The placement of cultch for the submerged oyster reefs would result in short-term, minor, temporary impacts to water quality, specifically short-term elevations in turbidity. BMPs, along with other avoidance and mitigation measures required by state and federal regulatory agencies, would be employed to minimize any water quality and sedimentation impacts. Authoriztion pursuant to Rivers and Harbors Act Section 10 and Clean Water Act Section 404, and Clean Water Act Section 401 water quality certification would be required and all permit conditions would be adhered to.

12.29.5.2.3 Air Quality and Greenhouse Gas Emissions

Affected Resources

The Clean Air Act (CAA) requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. NAAQS have been set for six common air pollutants (also known as criteria pollutants)—particle pollution or particulate matter, ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead. Particulate matter is defined as fine particulates with a diameter of 10 micrometers or less (PM_{10}) and fine particulates with a diameter of 2.5 micrometers or less ($PM_{2.5}$). When a designated air quality area or airshed in a state exceeds a NAAQS, that area may be designated as a “nonattainment” area. Areas with levels of pollutants below the health-based standard are designated as “attainment” areas. To determine whether an area meets the NAAQS, air monitoring networks have been established and are used to measure ambient air quality. The EPA also regulates 187 hazardous air pollutants (HAPs) that are known or suspected to cause cancer or other serious health impacts.

Air quality in the Florida panhandle is in attainment with the NAAQS (EPA 2013a). The FDEP Northwest District currently operates two air monitors near the proposed project areas, one in Santa Rosa County (Woodlawn Beach Middle School) and one in Bay County (St. Andrews State Park). The Woodlawn Beach Middle School monitor in Gulf Breeze records ozone and $PM_{2.5}$ concentrations, and the St. Andrews State Park monitor in Panama City records ozone and $PM_{2.5}$ concentrations. Readings at these monitors for the last 3 years show attainment with the NAAQS for ozone and $PM_{2.5}$ (FDEP 2013a). Sulfur dioxide attainment data were not available for these areas (EPA 2013b).

Greenhouse Gases

Gases that trap heat in the air are called greenhouse gases (GHGs). The primary GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_x), and fluorinated gases. Over the past century, human activities have released large amounts of GHGs into the atmosphere, which are contributing to global warming. Global warming is defined as the ongoing rise in global average temperature near the Earth's surface and is known to cause changes in climate patterns.

According to the EPA, the average annual temperature in the southeastern portion of the United States has increased by approximately 2.0 degrees Fahrenheit (°F) since 1970. Winters, in particular, are getting warmer, and the average number of freezing days has decreased by 4 to 7 days per year since the mid-1970s. Most areas are getting wetter; autumn precipitation has increased by 30% since 1901 (EPA 2013c). In many parts of the region, the number of heavy downpours has increased. Despite the increases in fall precipitation, the area affected by moderate and severe drought has increased since the mid-1970s (EPA 2013c).

Average annual temperatures in the region are projected to increase from 4°F to 9°F by 2080. Hurricane-related rainfall is projected to continue to increase. Models suggest that rainfall will arrive in heavier downpours, with increased dry periods between storms. These changes would increase the risk of both flooding and drought. The coasts will likely experience stronger hurricanes and sea level rise. Storm surges could present problems for coastal communities and ecosystems (EPA 2013c).

Total GHG emissions in the state of Florida from 1990 to 2007 have increased at an average rate of 2.1% per year. Total GHG emissions in 2007 were 290 million metric tons of CO_2 equivalent (CO_2e). In 2007, 91% of GHG emissions in Florida were CO_2 emissions (FDEP 2010).

Environmental Consequences

Oyster cultch restoration would take place in nearshore, open-water habitats in three Florida bays. Existing air quality and GHGs are affected by shoreline development and management, as well as boat traffic in the bays and Gulf of Mexico. Air quality within the Florida panhandle is in attainment with the NAAQS.

Project implementation would require the use of heavy equipment, which would temporarily affect air quality in the project vicinity due to construction vehicle emissions. Fine particulate matter associated with the oyster cultch placement may become airborne during materials transfers and the deployment process. Available BMPs would be employed to prevent, mitigate, and control potential air pollutants during project implementation. No air quality–related permits would be required. Any air quality impacts that would occur would be localized and short in duration. Therefore, impacts to air quality would not be considered significant.

In terms of construction equipment, the barge, dump truck, and front-end loader would likely contribute most of the GHG emissions; GHG emissions from remaining equipment would be negligible. GHG emissions from the barge have been estimated using the operating assumption of 8 hours per day and 192 days of use for cultch loading, transportation, and offloading, and GHG emissions from the dump truck and front-end loader have been estimated using the operating assumption of 8 hours per day and 54 days of use for cultch loading. These estimates represent maximum usage based on proposed construction plans. Based on the estimated 300 days of combined equipment operation, the project would be estimated to contribute approximately 912.72 metric tons of total CO_2e emissions (Table 12-71), well below the EPA threshold of 25,000 metric tons per year for GHG emissions. Therefore, the proposed project would result in a minor impact to ambient air quality.

Table 12-71. Greenhouse Gas Impacts of the Proposed Project for Major Construction Equipment.

CONSTRUCTION EQUIPMENT	NO. OF DAYS OPERATED[1]	CO_2 (METRIC TONS)[2]	CH_4 (CO_2e) (METRIC TONS)[3]	NO_x (CO_2e) (METRIC TONS)	Total CO_2e (METRIC TONS)
Barge	192	864.0	1.92	7.68	873.6
Dump truck	54	18.36	0.01	0.11	18.48
Front end loader	54	20.52	0.01	0.11	20.64
Total					**912.72**

[1] Emissions assumptions for all equipment based on 8-hour days of operation per piece of equipment.
[2] CO_2 emissions assumptions for diesel and gasoline engines based on EPA (2009).
[3] CH_4 and NOx emissions assumptions and CO_2e calculations based on EPA (2011).

12.29.5.2.4 Noise

Affected Resources

Noise can be defined as unwanted or nuisance sound. The Noise Control Act of 1972 (42 USC 4901–4918) was enacted to establish noise control standards and to regulate noise emissions from commercial products such as transportation and construction equipment. Amplitude is the magnitude of a sound and is usually expressed in decibels (dB), a dimensionless ratio of sound pressure to a reference pressure. The A-weighted decibel (dBA) is the adjusted unit of sound used to describe the human response to noise from industrial and transportation sources. The threshold of hearing is 0 dB. A 3-dB increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear.

Table 12-72 shows typical noise levels for common sources expressed in dBA. Noise exposure depends on how much time an individual spends in different locations.

Ambient noise levels in the project area are moderate. The major noise-producing source of the area year-round is related to urbanized areas and commercial, industrial, and residential boating. The waterways are typical of this part of Florida, with significant boat traffic and associated noise, especially on weekends.

Table 12-72. Typical noise levels for common sources.

NOISE SOURCE OR EFFECT	SOUND LEVEL (dBA)
Rock-and-roll band	110
Truck at 50 feet	80
Gas lawn mower at 100 feet	70
Normal conversation indoors	60
Moderate rainfall on foliage	50
Refrigerator	40
Bedroom at night	25

Source: Adapted from U.S. Department of Energy and Bonneville Power Administration (1986).

Environmental Consequences

The proposed project would generate most of its associated construction noise from cultch loading and offloading, with minor noise during cultch transportation. While this noise would be evident to those workers on the job and the immediate area, the project would not significantly add to existing ambient noise levels. Normal noise levels would be achieved at the end of each workday and after completion of the job. Short-term impacts associated with construction would be minor, and no long-term adverse impacts would occur.

12.29.5.3 Biological Environment

12.29.5.3.1 Living Coastal and Marine Resources

Coastal and Submerged Aquatic Vegetation

Affected Resources

The presence and productivity of seagrasses in nearshore environments largely depends upon light availability. Although seagrasses have been recorded at 230-foot depths in clear waters, they are more generally restricted to shallow ocean or estuarine waters due to the rapid decline of light with depth (Green and Short 2003). In addition to the availability of light, a number of other factors also affect seagrasses. These include water temperature, salinity, sediment and water nutrient content, wave fetch (length of open water over which the wind can blow unimpeded), turbidity, and water depth (Koch 2001; Merino et al. 2005; USFWS 1999). Seagrasses generally grow in salinities that range from fresh water to 42 parts per thousand (ppt) and can tolerate short-term salinity fluctuations, but most have an optimum salinity range from 24 to 35 ppt.

Environmental Consequences

The occurrence of seagrasses at the project site is not likely, due to the water quality and other past disturbance to the project areas. Past surveys, discussed above, also indicate that there are no seagrass beds in the vicinity of the project areas in Pensacola Bay, St. Andrew Bay or Apalachicola Bay. Therefore

no environmental consequences to seagrass beds are anticipated. Instead, the proposed project would likely benefit water quality in the three bay systems.

Due to the lack of existing seagrass beds or minimal coverage of seagrass in the project area, no adverse impacts from the proposed activities would be expected. Additionally, BMPs to avoid impacts to seagrass have been incorporated into the construction plan, including 1) situating anchoring sites to avoid impacts to seagrass, if found to be in the project area; 2) avoiding access over existing seagrass to the extent practicable to minimize prop-scarring impacts; and 3) monitoring turbidity levels during construction and implementing additional BMPs if turbidity levels rise too high based on local and state regulatory/permit levels.

Marine and Estuarine Fauna (fish, shell beds, and benthic organisms)

Affected Resources

The project areas in Bay, Escambia, Franklin, and Santa Rosa Counties provide habitat for numerous fish and other marine species. The value of marine habitats at the proposed project area has been affected by population growth, urban development, and water contamination from runoff and wastewater disposal. Increased coastal development, in particular, has contributed to displaced habitats, loss of wetlands, and greater amounts of stormwater runoff entering rivers, bays, and their tributaries (Northwest Florida Water Management District [NFWMD] 2011). Nonetheless, the marine environment at the project sites provides habitat to an array of aquatic species, including ladyfish (*Elops saurus*), hardhead catfish (*Arius felis*), gafftopsail catfish (*Bagre marinus*), and pigfish (*Orthopristis chrysoptera*), among others. Benthic organisms, such as bivalves, gastropods and other mollusks, anemones, amphipods, annelids, crustaceans, and echinoderms, can also be abundant in these waters (FWC 2001).

Environmental Consequences

No adverse impacts to fish, shell beds, and benthic organisms would be anticipated as a result of project implementation. Oyster shells would be added in areas where they are already part of the natural marine ecosystem; therefore, short- and long-term, moderate benefits would be likely to occur.

Protected Species

Affected Resources

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

The Trusteeshave reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA for species managed by USFWS. For this, the Trusteesfirst reviewed the species list for Escambia, Santa Rosa, Bay, and Franklin cunties, Florida where the project could be implemented[45]. Table 12-73 presents

[45] The U.S. Fish and Wildlife, Panama City office website (http://www.fws.gov/panamacity/specieslist.html) provides a county-based list of federal threatened, endangered, and other species of concern likely to occur in the Florida Panhandle. Information

a summary of these potentially affected species/critical habitats and the nature of the potential impact that could result from project implementation.

Table 12-73. Potential Impacts to Species/Critical Habitats managed by USFWS

SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
Green turtle[a], Hawksbill turtle[a], Kemp's ridley turtle; Leatherback turtle[a], Loggerhead turtle	No work will occur in the terrestrial environment; therefore no impacts will occur to sea turtle species in the terrestrial environment. Consultation has been completed with NMFS, the agency that has jurisdiction to review impacts to sea turtles in the estuarine and marine environments. The main risk to sea turtles during implementation of this project would come from boat collisions which could result in harm or mortality. Critical habitat for the green sea turtle has been designated for the waters surrounding Culebra Island, Puerto Rico, and its outlying keys (63 FR 46693). Marine and terrestrial critical habitat for the leatherback sea turtle has been designated at Sandy Point on the western end of the island of St. Croix, U.S. Virgin Islands (44 FR 17710) and critical habitat will be reassessed during the future planned status review (76 FR 47133). Critical habitat for the hawksbill sea turtle has been designated for selected beaches and/or waters of Mona, Monito, Culebrita, and Culebra Islands, Puerto Rico (63 FR 46693). No designated critical habitat for the green, leatherback, or hawksbill sea turtles occurs within the action area. No critical habitat has been designated for the Kemp's ridley sea turtle; therefore, none will be adversely affected or modified. The project area is all in-water and does not overlap with the currently proposed critical habitat areas in Florida for Northwest Atlantic Distinct Population Segment of the loggerhead sea turtle as these habitats are terrestrial (i.e., beaches and shorelines) (78 FR 18000)Department of the Interior, 2013). The proposed project will not result in any changes to shoreline habitats that could alter adjacent beaches with proposed critical habitat; therefore no impacts are expected.
West Indian manatee	The counties in the project area are not part of the 36 Florida counties that are identified as being counties where manatees regularly occur in coastal and inland waters (U.S. Department of the Interior, 2011). However, manatees could be present in the project waters. The main risk to manatees during implementation of this project would come from boat collisions which could result in harm or mortality. These risks will be minimized to an insignificant or discountable level or avoided through the implementation of conservation measures.
Piping plover	The main risk to Piping plovers is from human disturbance while resting, foraging in habitats adjacent to marine work areas. The proposed project implementation including, eventual harvest, could result in short term increases in noise which could startle individuals, though due to the distance from the shore, startling seems unlikely. In the event of startling, the Trusteeswould expect normal activity to resume within minutes and do not expect any temporary displacement. The Trusteesconsider these impacts insignificant and discountable. The proposed project will not result in any changes to shoreline habitats where piping plover could be feeding or resting and is not expected to increase visitor use; therefore, no indirect impacts are expected. The proposed project will not result in any changes to shoreline habitats, including nearby critical habitat where piping plover could be feeding or resting therefore, no impacts are expected.
Red knot	The main risk to Red knots is from human disturbance while resting, foraging in habitats adjacent to marine work areas. The proposed project implementation including, eventual harvest, could result in short term increases in noise which could startle individuals, though due to the distance from the shore, startling seems unlikely. In the event of startling, the Trusteeswould expect normal activity to resume within minutes and do not expect any temporary displacement. The Trusteesconsider these impacts insignificant and discountable. The proposed project will not result in any changes to shoreline habitats where red knot could

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SPECIES/CRITICAL HABITAT	SPECIES/CRITICAL HABITAT IMPACTS
	be feeding or resting and is not expected to increase visitor use; therefore, no indirect impacts are expected.
Gulf sturgeon	NMFS was consulted on Gulf sturgeon and its Critical Habitat in the estuarine environment. As a result, Gulf Sturgeon was not considered in the consultation with the USFWS.

In addition to the protected species managed by USFWS, the Trusteesreviewed the proposed projects and associated actions for potential impacts to the following protected species (status indicated) and their associated critical habitat, if appropriate, managed by NMFS:

- Gulf Sturgeon, *Acipenser oxyrinchus desotoi*, Threatened
- Smalltooth Sawfish, *Pristis pectinata,* Endangered
- Green Sea Turtle, *Chelonia mydas*, Endangered
- Loggerhead Sea Turtle, *Caretta caretta*, Threatened
- Hawksbill Sea Turtle, *Eretmochelys imbricata*, Endangered
- Leatherback Sea Turtle, *Dermochelys coriacea*, Endangered
- Kemp's Ridley Sea Turtle, *Lepidochelys kempii*, Endangered.

Additional information on some of these species is presented below.

Sea Turtles and Marine Mammals

There are five species of endangered or threatened sea turtles that may occur or have the potential to occur in the project area. These include green turtle, hawksbill turtle, Kemp's ridley turtle, leatherback turtle, and loggerhead turtle. Sea turtles forage in the waters of the coastal Florida panhandle region and have the potential to occur in the waters where in-water work is proposed. The project site contains potentially suitable sea turtle nesting habitat along the sandy beach, but the site is on the bay side where nesting is uncommon.

Twenty-two marine mammals are native to the Gulf of Mexico: 21 pelagic species of whales and dolphins, and the West Indian manatee (see Chapter 3). Of these species, the endangered West Indian manatee has the potential to occur in the project area waters. Manatee typically seek out shallow seagrass areas as preferred feeding habitat. Additionally, bottlenose dolphin (*Tursiops*) populations are known to migrate into bays, estuaries, and river mouths and could be located in the proposed project area (NMFS 2013a). Bottlenose dolphins have been observed entering and leaving nearshore coastal waters (NMFS 2012).

Gulf Sturgeon

Gulf sturgeon are restricted to the Gulf of Mexico and its drainages, occurring primarily from the Pearl River in Louisiana to the Suwannee River, in Florida (NMFS 2009). Adult fish reside in rivers for 8 to 9 months each year and in estuarine or Gulf of Mexico waters during the 3 to 4 cooler months of each year (NMFS 2009). Important marine habitats include seagrass beds with sand and mud substrates (Mason and Clugston 1993). Gulf sturgeon critical habitat was jointly designated by the NMFS and USFWS on April 18, 2003 (50 Code of Federal Regulations [C.F.R.] 226.214). Two of the three project sites are located within gulf sturgeon designated critical habitat. The Escambia County project site is located in Pensacola Bay Critical Habitat Unit 9 and the Franklin County project site is located in

Apalachicola Bay Critical Habitat Unit 13. Critical habitat was designated based on seven primary constituent elements (PCEs) essential for the species' conservation, as defined in the 2003 *Federal Register* notice for gulf sturgeon critical habitat (*Federal Register* 2003).

According to the 2003 *Federal Register* notice for gulf sturgeon critical habitat, the Pensacola Bay system provides winter feeding and migration habitat for gulf sturgeon from the Escambia River and Yellow River subpopulations. Over the past 4 years, FDEP researchers have conducted tracking studies in the Pensacola Bay system to observe gulf sturgeon winter migrations and have identified specific areas in the bays where Escambia River and Yellow River gulf sturgeon collect, or migrate through, during the fall and winter season. These studies also identified two main habitat types where gulf sturgeon concentrate during winter months. Movement is generally along the shoreline area of Pensacola Bay. Gulf sturgeon showed a preference for several areas in the bay, including Redfish Point, Fort Pickens, and Escribano Point, near Catfish Basin (Craft et al. 2001:32; NMFS 1998). Sandy shoal areas, located along the south and east sides of Garcon Point, the south shore of East Bay (Redfish Point area), and near Fair Point, appear to be commonly used, especially in the fall and early spring. During midwinter, sturgeon are commonly found in deep holes located north of the barrier island at Fort Pickens, south of the Pensacola Naval Air Station, and at the entrance of Pensacola Pass. The depth in these areas ranges from 6 to 12.1 meters (20–40 feet). Other areas where tagged fish were frequently located include Escribano Point, near Catfish Basin, and at the mouth of the Yellow River. Previous incidental captures of gulf sturgeon have been recorded in Pensacola Bay, Big Lagoon, and Bayou Grande (Lorio 2000; Reynolds 1993).

The 2003 *Federal Register* provides further information for the Apalachicola Bay system; it states that Apalachicola Bay provides winter feeding migration habitat for the Apalachicola River gulf sturgeon subpopulation. Gulf sturgeon have been documented by sightings, incidental captures, and telemetry studies throughout Apalachicola Bay, East Bay, St. George Sound, St. Vincent Sound, and Indian Lagoon (Odenkirk 1989; Swift et al. 1977; Wooley and Crateau 1985). Gulf sturgeon have also been documented in Indian Pass, West Pass, East Pass, and just north of Dog Island (Odenkirk 1989; Wooley and Crateau 1985). Substantial weight gain and the presence of suitable habitat for prey items indicate that gulf sturgeon are feeding while in these bodies of water (Odenkirk 1989; Wooley and Crateau 1985). These areas are also used for accessing adjacent marine and estuarine feeding areas proposed in Unit 11. Gulf sturgeon are believed to migrate from Apalachicola Bay into the Gulf of Mexico, following prevailing currents and exiting primarily through the two westernmost passes (Indian and West) (Odenkirk 1989). No gulf sturgeon have been documented using Sike's Cut, a human-made opening established in the 1950s that bisects Little St. George Island and St. George Island; therefore, Sike's Cut is excluded from the Trustees'proposed designation. See Figure 12-60 for critical habitat areas for gulf sturgeon.

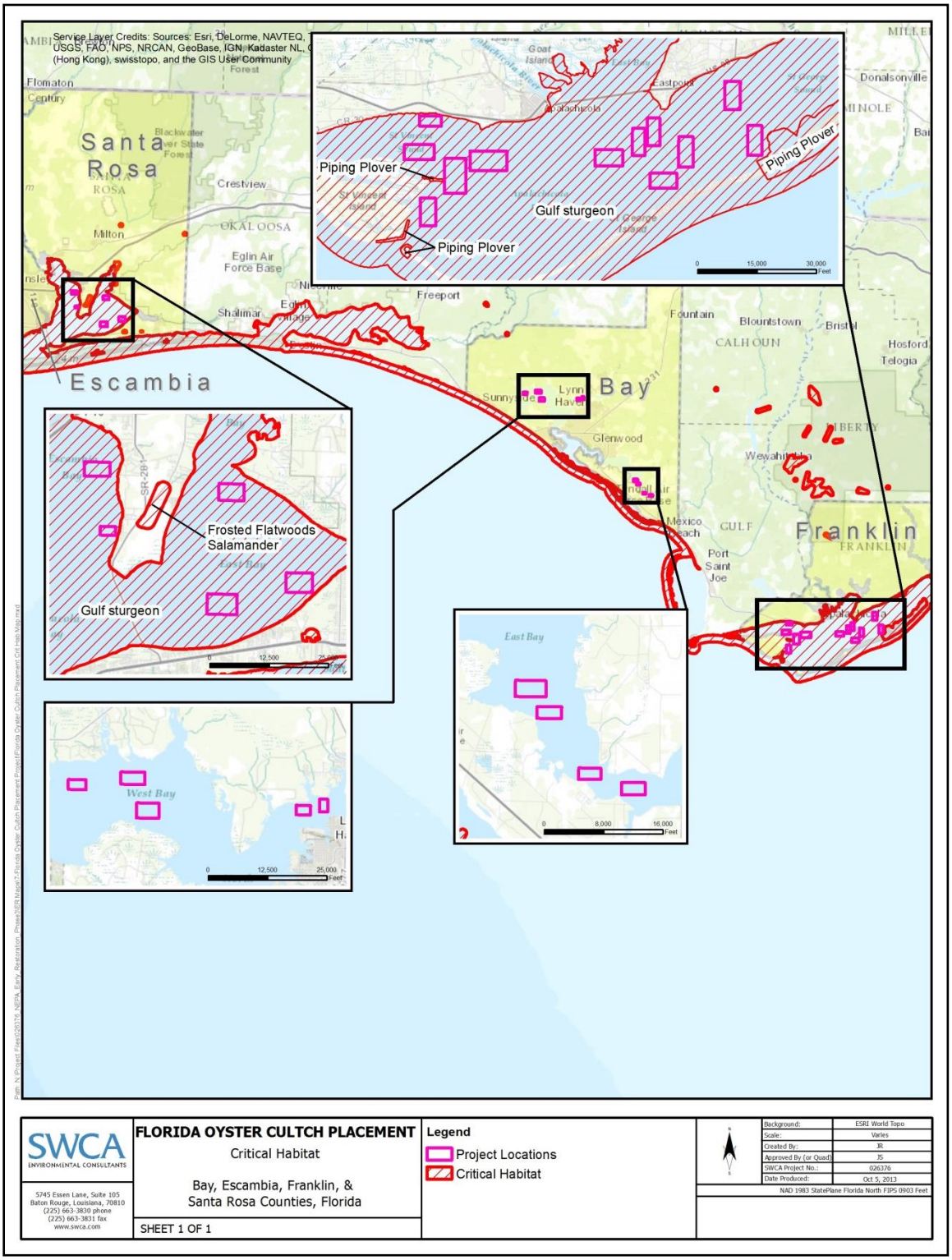

Figure 12-60. Critical habitat map for oyster cultch restoration project locations.

Piping Plover

The sandy beaches and shorelines adjacent to the project area offer suitable foraging and resting habitat for the piping plover during the winter migratory season, and piping plover may forage in the shallow waters of the project area. Natural shorelines in the proposed project vicinity provide suitable winter migration resting habitat for the piping plover. Piping plover wintering habitat includes beaches, mudflats, and sandflats, as well as barrier island beaches and spoil islands (Haig 1992 as cited by USFWS 2013). On the Gulf Coast, preferred foraging areas are associated with wider beaches, mudflats, and small inlets (USFWS 2013).

Red Knot

The red knot, a federal proposed species, uses the state of Florida both for wintering habitat and migration stopover habitat for those that continue to migrate down to specific wintering locations in South America (Niles et al. 2008) and could be present in the project area. Wintering and migrating red knots forage along sandy beaches, tidal mudflats, saltmarshes, and peat banks (Harrington 2001). Observations indicate that red knots also forage on oyster reef and exposed bay bottoms, and roost on high sand flats, reefs, and other sites protected from high tides (Niles et al. 2008). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Threats to wintering and stopover habitat in Florida include shoreline development, hardening, dredging, deposition, and beach raking (Niles et al. 2008).

Essential Fish Habitat

EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity." The designation and conservation of EFH seeks to minimize adverse impacts on habitat caused by fishing and non-fishing activities. The NMFS has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates, and the estuarine water column. The EFH within the project area include emergent wetlands, mud substrate, and estuarine water columns for species of fish, such as red drum, brown shrimp, pink shrimp, and white shrimp. There are no marine components of EFH in the vicinity of the project site.

Table 12-74 provides a list of the species that NMFS manages under the federally Implemented Fishery Management Plan in the vicinity of Pensacola, Andrew and Apalachicola Bays.

Table 12-74. Federally managed fisheries with designated Essential Fish Habitat (EFH) in the proposed project area.

EFH_CATEGORY	SPECIES
Atlantic Highly Migratory Species	
	Atlantic Sharpnose Shark - Adult
	Atlantic Sharpnose Shark - Juvenile
	Atlantic Sharpnose Shark - Neonate
	Blacknose Shark - Adult
	Blacknose Shark - Juvenile
	Blacknose Shark - Neonate

EFH_CATEGORY	SPECIES
	Blacktip Shark - Adult
	Blacktip Shark - Juvenile
	Blacktip Shark - Neonate
	Bonnethead Shark - Adult
	Bonnethead Shark - Juvenile
	Bonnethead Shark - Neonate
	Bull Shark - Adult
	Bull Shark - Juvenile
	Bull Shark - Neonate
	Finetooth Shark - Adult and Juvenile
	Great Hammerhead Shark All
	Lemon Shark - Adult
	Nurse Shark - Adult
	Nurse Shark - Juvenile
	Sandbar Shark - Adult
	Sandbar Shark - Neonate
	Scalloped Hammerhead Shark - Adult
	Scalloped Hammerhead Shark - Juvenile
	Scalloped Hammerhead Shark - Neonate
	Spinner Shark - Adult
	Spinner Shark - Juvenile
	Spinner Shark - Neonate
	Tiger Shark - Juvenile
Coastal Migratory Pelagics of the Gulf of Mexico AND South Atlantic	
	Cobia
	King Mackerel
	Spanish Mackerel
Gulf of Mexico Red Drum	
	Red Drum
Gulf of Mexico Shrimp	
	Brown Shrimp
	Pink Shrimp
	White Shrimp
Reef Fish Resources of the Gulf of Mexico	
	Almaco Jack
	Banded Rudderfish
	Black Grouper
	Blackfin Snapper
	Blueline Tilefish
	Cubera Snapper
	Gag
	Goldface Tilefish

EFH_CATEGORY	SPECIES
	Gray (Mangrove) Snapper
	Gray Triggerfish
	Greater Amberjack
	Hogfish
	Lane Snapper
	Lesser Amberjack
	Mutton Snapper
	Nassau Grouper
	Queen Snapper
	Red Grouper
	Red Snapper
	Scamp
	Silk Snapper
	Snowy Grouper
	Speckled Hind
	Tilefish
	Vermilion Snapper
	Warsaw Grouper
	Wenchman
	Yellowedge Grouper
	Yellowfin Grouper
	Yellowmouth Grouper

State-listed Birds, MBTA, and BGEPA

Migratory birds are protected under the MBTA. In Florida, the nesting season is from March 1 through August 1. However, raptors such as osprey and kites typically begin nesting behavior in late February or early March. Bald eagles are protected under the BGEPA. The bald eagle nesting season in Florida is from October 1 to May 15. The nearest bald eagle nest from activities proposed in Escambia Bay is approximately 3 miles north. There are several bald eagle nests throughout the St. Andrews Bay system, ranging from approximately 2 to 5 miles from proposed activities. There are numerous bald eagle nests within the Apalachicola Bay system, due in part to the more rural nature of this part of Florida; the nests are mainly located on St. Vincent Island and St. George Island. Some of the proposed oyster cultch placement in Apalachicola Bay are within a mile of eagle nests on St Vincent and St. George Islands (FWC 2013).

The proposed project was also reviewed for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), respectively. Table 12-75 provides a summary of the different migratory bird groups specifically addressed by this review and summarizes the potential impacts to these groups and associated habitats that could result from the implementation of this project.

Table 12-75. Potential project impacts to different migratory bird groups

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, roosting, nesting	While seabirds forage, rest, or nest in the general vicinity of the project area, the project will take place at least a half mile offshore and most roosting/nesting occurs in the dune habitat. The level of project activity in open water could startle birds; however, is not expected to disrupt feeding, resting, or nesting.

Considering the nature of the potential project and the potential impacts to migratory bird groups and associated habitats, a number of conservation measures were identified and will be followed to minimize potential impacts. These measures are summarized in Table 12-76.

Table 12-76. Conservation measures to minimize impacts to migratory bird groups

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care will be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project will occur during daylight hours only. Nesting should not be impacted because the project will not occur in nesting habitats and activity is limited to open water areas.

Environmental Consequences

Protected Species

The USFWS reviewed the proposed project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the ESA. On January 23, 2014 the review of potential impacts to species managed by USFWS was completed (McClain, 2014). The USFWS concurred with the Trustees'determination that the proposed project may affect, but is not likely to adversely affect, West Indian manatee, piping plover, and red knot (if listed). In addition, The USFWS also concurred with the Trustees'determination that the project will have no effect on five species of sea turtles in terrestrial habitats (green, hawksbill, Kemp's ridley, leatherback, and loggerhead).

NMFS similarly completed its review of the proposed project on April 4, 2014 (Croom, 2014). Their review similarly concurred with the Trustees'determination that the proposed project is not likely to adversely affect green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles, smalltooth sawfish, and Gulf sturgeon. The NMFS review also concurred that the proposed project's impacts on Gulf sturgeon critical habitat would be discountable.

The Trustees also evaluated the potential for take of Marine Mammals under the MMPA and due to these species' mobility and the implementation of NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006), *Standard Manatee Conditions for In-Water Work* (USFWS 2011),

and USFWS recommended conservation measures for listed species and other trust resources, take of marine mammals under the MMPA is not anticipated.

Essential Fish Habitat

In the Trustees'review of the proposed project's potential impacts on EFH the Trusteesdetermined it is unlikely that the placement and use of oyster cultch would have any adverse effect to federally managed species or designated EFH, since any initial disturbance would be very brief, would not interfere with EFH used for migration, spawning or refuge areas, and would eventually be likely to benefit many federally managed species. Additionally, the habitat in the proposed location is already managed for use consistent with the restoration project and there should not be any significant habitat conversion as a result of the placement. Placement of the cultch can occur relatively quickly and any disturbance would be brief. Movement of HMS would not be impeded by the oyster cultch. The possibility for oyster bars interfering with vessel navigation is also low, as cultch would be placed in locations where oyster reefs are already located and maintained by DACS.

It is anticipated that offloading cultch material from barges using spray cannons or large excavator type equipment would have only brief and minor impacts to any federally managed species or designated EFH. The duration and extent of disturbance would not significantly interfere with species migration, nesting or refuge areas, since adjacent areas of similar habitat would be available and undisturbed, and most organisms could easily move away from the temporary disturbance activity to undisturbed areas when it occurs. Best management practices for construction would be followed to minimize impacts.

The project would have a relatively small spatial impact relative to the Gulf of Mexico management area. Finally, the lack of adverse impacts is a reflection of the *net* impact of the project which is focused on restoring a habitat critical to native oysters, which would not be suitable if the bars were not restored. It is anticipated that the proposed project would provide a net benefit to the communities present, to the habitat services they provide, and to biological resources that depend on them.

As a result, the Trusteesdetermined that the proposed project is not likely to adversely affect EFH. Implementing the project would not result in the creation or conversion of one EFH habitat type to another type as cultch placement is only proposed to occur in areas that previously supported oyster bars. Disturbance to any EFH and species using the habitat in areas adjacent to locations where bars would be restored would be brief and insignificant with risks further mitigated by following identified best management practices during construction. No adverse impacts to other EFH types would result from the proposed restoration techniques.

On March 17, 2014 NMFS completed its evaluation of potential EFH impacts and concurred with the Trustees'determination that the proposed project is unlikely to adversely affect EFH since implementing the project would not result in the creation or conversion of one EFH habitat type to another (Fay, 2014).

State-listed Birds, MBTA, and BGEPA

Bald eagles are not present at the project location so will not be affected. At the same time, implementation of the conservation measures previously identified in the review of potential impacts to migratory birds will prevent take of the identified migratory bird groups.

Invasive Species

Affected Resources

Non-native invasive species could alter the existing terrestrial or aquatic ecosystem within, and possible expand out into adjacent areas after the initial introduction. The invasive species threat, once realized, could result in economic damages. Prevention is ecologically responsible and economically sound. Chapter 3 described more about the regulations addressing invasive species, pathways, impacts, and prevention. At this time specific invasive species that may be present on the project site or could be introduced through the project have not yet been identified.

Environmental Consequences

Best Management Practices (BMPs) to control the spread of any invasive species present, and prevent the introduction of new invasive species due to the project will be implemented. In general, best management practices would primarily address risk associated with vectors (e.g., construction equipment, personal protective equipment, delivery services, foot traffic, vehicles/ vessels, shipping material). There are many resources that provide procedures for disinfection, pest-free storage, monitoring methods, evaluation techniques, and general guidelines for integrated pest management that can be prescribed based upon specific site conditions and vectors anticipated. In addition, to best management practices, outreach and educational materials may be provided to project workers and potential users/visitors. Other measures that could be implemented are identified in the Chapter 6 Appendix. Due to the implementation of BMPs, the Trusteesexpect impacts due to invasive species introduction and spread to be short term and minor.

12.29.5.4 Human Uses and Socioeconomics

12.29.5.4.1 Socioeconomics and Environmental Justice

Affected Resources

The proposed project area spans four counties; these include Bay, Escambia, Franklin, and Santa Rosa Counties. Census information for these counties is listed in Table 12-77 (U.S. Census Bureau 2013).

Table 12-77. Census Data for Bay, Escambia, Franklin, and Santa Rosa Counties.

POPULATION	FLORIDA		BAY COUNTY		ESCAMBIA COUNTY		FRANKLIN COUNTY		SANTA ROSA COUNTY	
Population, 2010	18,801,310		168,852		302,715		11,549		158,512	
White alone	14,721,426	78.3%	139,978	82.9%	212,203	70.1%	9,597	83.1%	138,698	87.5%
Black or African American	3,121,017	16.6%	18,743	11.1%	69,321	22.9%	1,628	14.1%	10,303	6.5%
American Indian and Alaska Native alone	94,007	0.5%	1,182	0.7%	2,724	0.9%	81	0.7%	1,427	0.9%
Asian alone	507,635	2.7%	3,715	2.2%	8,779	2.9%	46	0.4%	3,170	2.0%
Native Hawaiian and other Pacific Islander alone	18,801	0.1%	169	0.1%	605	0.2%	12	0.1%	317	0.2%

POPULATION	FLORIDA		BAY COUNTY		ESCAMBIA COUNTY		FRANKLIN COUNTY		SANTA ROSA COUNTY	
Two or more races	357,225	1.9%	4,897	2.9%	9,081	3.0%	185	1.6%	4,597	2.9%
Hispanic or Latino	4,361,904	23.2%	8,780	5.2%	15,438	5.1%	577	5.0%	7,767	4.9%
White alone, not Hispanic or Latino	10,716,747	57.0%	132,718	78.6%	19,979	66.0%	9,078	78.6%	132,199	83.4%

Source: U.S. Census Bureau (2013).

Environmental Consequences

This project would have short-term, minor, direct adverse impacts on socioeconomic resources through the disruption of localized fishing during construction. Direct, short-term, moderate benefits through local job creation would result from construction activities. Long-term, indirect moderate benefits would result from increasing fisheries habitat along with the recreational and fishing values of the area.

This project is not designed to create a benefit for any group or individual, but rather would provide benefits on a local and regional basis. There are no indications that the proposed oyster reef restoration would be contrary to the goals of Executive Order 12898 or would create disproportionate, adverse human health or environmental impact on minority or low-income populations of the surrounding community.

12.29.5.4.2 Cultural Resources

Affected Resources

This project is currently being reviewed under Section 106 of the NHPA to identify any historic properties located within the project area and to evaluate whether the project would affect any historic properties. While the Section 106 review process is ongoing, an initial review of the project has not identified the presence of a historic property within the project area.

Environmental Consequences

A complete review of this project under Section 106 of the NHPA is ongoing and would be completed prior to any project activities that would restrict consideration of measures to avoid, minimize or mitigate any adverse impacts on historic properties located within the project area. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

12.29.5.4.3 Infrastructure

Affected Resources

Oyster reef restoration would take place in open-water habitats, away from any and all infrastructure.

Environmental Consequences

Oyster reef restoration would have no effect on infrastructure because the project work would take place in open-water habitat, away from existing infrastructure.

12.29.5.4.4 Land and Marine Management

Affected Resources

Oyster reef restoration would take place in open-water habitat in three Florida bays. There are existing management plans adjacent to oyster cultch placement in Escambia County, Gulf Islands National Seashore and Fort Pickens Aquatic Preserve; however, activities would occur outside the park and preserve boundaries. A management plan does cover the area where oyster cultch activities would occur in Franklin County. The Apalachicola National Estuarine Research Reserve (NERR) covers all of Apalachicola Bay (FDEP 2013b).

Environmental Consequences

Oyster reef restoration would have a moderate to major beneficial impact on marine management in the Florida panhandle. The project is expected to increase the amount of oyster reef present and lead to an increase in oyster populations throughout the Florida panhandle. All project work would be completed consistent with state and federal management plans.

Under the Coastal Zone Management Act of 1972, the selection of the projects for early restoration must be consistent to the maximum extent practicable with the federally-approved coastal management programs for the states where the activities would affect a coastal use or resource. The Federal Trustees submitted a consistency determination for appropriate state review coincident with the public review of the Phase III DERP/PEIS (Federal Trustees 2013). The State of Florida responded and concurred with the federal determination of consistency at this point in the early restoration planning process (Milligan 2014).

12.29.5.4.5 Aesthetics and Visual Resources

Affected Resources

The environment to be affected by the proposed project consists of open water at three locations in western Florida: (1) Pensacola Bay located in Escambia and Santa Rosa Counties, (2) St. Andrews Bay in Bay County, and (3) Apalachicola Bay in Franklin County. The three viewsheds consist of open bay waters that are visible from adjacent shorelines.

Environmental Consequences

Temporary impacts to visual resources would result from construction activity associated with enhancing existing oyster reefs. Placement of barges with cranes for lowering oyster cultch material would temporarily obstruct views of residents and visitors along the adjacent shoreline. However, the time needed for the cultch deployment is short, and, therefore, visual and aesthetic impacts would be for a short duration. The vertical profile of the deployed oyster cultch is designed to be below the water surface, and should not be visible from above the water. Overall, impacts to visual resources would be short term and minor.

12.29.5.4.6 Tourism and Recreational Use

Affected Resources

Tourism and recreation are common throughout the Florida panhandle region. Oyster reef restoration would be completed at locations throughout the panhandle and may take place in some areas where tourism and recreation are common.

Environmental Consequences

Oyster reef restoration would have either no impact or a beneficial impact on tourism and recreational use. If successful, the project may provide increased opportunities for oyster harvesting by recreational oyster fishermen.

12.29.5.4.7 Public Health and Safety and Shoreline Protection

Affected Resources

The management of hazardous materials is regulated under various federal and state environmental and transportation laws and regulations, including the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Emergency Planning and Community Right-to-Know Act; and the Hazardous Materials Transportation Act. The purpose of the regulatory requirements set forth under these laws is to ensure the protection of human health and the environment through proper management (identification, use, storage, treatment, transport, and disposal) of these materials. Some of these laws provide for the investigation and cleanup of sites that have already been contaminated by releases of hazardous materials, wastes, or substances.

A review of the EPA's EnviroMapper revealed that there are no CERCLA sites on or immediately adjacent to the proposed project area (EPA 2013b). The project would be conducted at multiple locations throughout the Florida panhandle. The specific public health and safety and shoreline protection conditions at each individual location may vary. Project locations would not be situated in areas with hazardous waste generation or disposal.

Environmental Consequences

Oyster reef restoration would have no impact on public health conditions because restoration techniques would follow health and safety guidance and would not take place in areas where public health conditions may be affected.

12.29.6 Summary and Next Steps

The proposed Florida Oyster Cultch project would enhance and improve the oyster populations in Pensacola Bay, Andrew Bay and Apalachicola Bay. The proposed improvements include the placement of a total of 42,000 cubic yards of suitable cultch material over 210 acres of previously constructed oyster bars for the settling of native oyster larvae and oyster colonization in three Florida Bays. The project is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement projects emphasizing the restoration of habitat and living coastal and marine resources as well as projects emphasizing the restoration of recreational opportunities.

NEPA analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resource categories, no moderate to major adverse impacts are anticipated to result. The project would provide long-term benefits by promoting reef development for oysters by restoring approximately 210 acres of existing oyster reef habitat. The Trustees considered public comment and information relevant to environmental concerns bearing on the proposed actions or their impacts. The Trustees' determination on selection of the project will be included in the Record of Decision.

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